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Joseph Priestley's First Papers on Gases and Their Reception in France

HENRY GUERLAC*

IN March of 1772—before we find any evidence that Lavoisier had turned his attention to the chemistry of gases—Joseph Priestley presented to the Royal Society of London, at a succession of meetings, the chief results that were to be embodied in his first important publication on gases, his *Observations on Different Kinds of Air*. It is commonly stated that this long paper—in which Priestley described his improved pneumatic trough, and the use of mercury in place of water for handling soluble gases, announced his discovery of new kinds of air (e.g., nitric oxide and hydrochloric acid), discussed the results Cavendish had obtained on "inflammable air" (hydrogen), and showed that nitrous air could be used to measure the "goodness of air"—was first printed later in the same year in the *Philosophical Transactions*.[1] The actual time of its appearance, if it can be ascertained more precisely, is a matter of some importance, especially if we wish to assess the early influence of Priestley upon Lavoisier. For this was a crucial year in Lavoisier's scientific career: it was in the autumn of 1772 that he carried out his dramatic experiments on the combustion of phosphorus and sulphur;[2] and it was on 20 February 1773 that he set down in a newly begun laboratory register his famous memorandum outlining the research program he planned to pursue "on the elastic fluid that is set free from substances . . . and also on the air absorbed in the combustion of a great many substances." Here, for the first time, he listed the names of those who had been pioneers in the study of fixed air: "Messrs. Hales, Black, Magbride [Macbride], Jacquin, Cranz, Prisley [Priestley], and de Smeth. . . ."[3] At first glance we would take this as evidence that Lavoisier was

* Cornell University, Ithaca, New York.

1 See, for example, J. R. Partington, *Short history of chemistry*, 2d ed., 1948, p. 113; Sir Philip J. Hartog, "The newer views of Priestley and Lavoisier," *Ann. Sci.*, 1941, *5*, 25; Douglas McKie, *Antoine Lavoisier*, 1935, p. 173; F. Hoefer, *Histoire de chimie*, 2e éd., 1869, II, 477 and note 2; H. Kopp, *Geschichte der Chemie*, 1843-5, pt. 1, 243.

2 A. N. Meldrum, "Lavoisier's three notes on combustion: 1772," *Archeion*, 1932, *14*, 15-30.

3 Printed in full in M. Berthelot, *La Révolution chimique—Lavoisier*, 1890, pp. 46-9. An English translation is given in Meldrum, *The eighteenth century revolution in science—the first phase*, 1930, pp. 8-10. Meldrum's translation, which I give here, is reproduced by McKie, *Antoine Lavoisier* (1935), pp. 120-3.

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already familiar with Priestley's *Observations on Different Kinds of Air,* and that this paper may well have been one of the earliest influences upon him. The matter, however, is somewhat more complex than appears at first sight.

Priestley's epoch-making paper, as the reader can readily verify, appeared in Volume LXII of the *Philosophical Transactions,* which bears on the title-page the name of the Royal Society's printer, Lockyer Davis in Holbourn, and the date 1772. But an examination of this volume of the *Transactions* make it clear that it did not actually appear in the year given, but early in 1773. Proof of this is contained in the preliminary material which includes a resolution passed at a meeting of the Royal Society's council on 28 January 1773 referring to a proposed change in the publication schedule of the journal.[4] For reasons probably connected with the new schedule, Volume LXII—which could hardly have appeared before February, and probably not until March 1773—was pre-dated to 1772. Priestley himself, in his *Memoirs,* clearly places the publication of the paper in the year 1773.[5]

This innocent printer's legerdemain explains why historians of chemistry have all assumed that Priestley's paper appeared in the *Transactions* in the same year in which it was delivered, although there is much evidence that Priestley included in it results that he obtained during the summer and autumn of 1772. Anyone would be forgiven—since the time of the supposed appearance of the *Transactions* in 1772 is never specified—who assumed that Lavoisier might have learned of it, not only before he wrote his memorandum of 20 February 1773, but perhaps earlier, i.e., by the time he began his long series of investigations, on combustion

[4] Here we read (*Phil. Trans., 62,* iv):

> At a COUNCIL, January 28, 1773
>
> Resolved, That after Volume LXII. the *Philosophical Transactions* be published twice in a year; the first publication to be of the months of November and December of the preceding year, and January and February of the current year, as soon as may be after February, under the name of the "first part" of the volume: and the second publication to be of the remaining months unto the recess of the Society, as soon as may be after the recess, under the name of the "second part" of the volume.

[5] *Memoirs of the Rev. Dr. Joseph Priestley* (London, 1809), pp. 56-7. Here he writes: "My first publication on the subject of air, was in 1772. It was a small pamphlet, on the method of impregnating water with fixed air; which being immediately translated into French, excited a great degree of attention to the subject, and this was much increased by the publication of my first paper of experiments, in a large article of the 'Philosophical Transactions,' *the year following,* for which I received the gold medal of the society." (Italics mine.)

OBSERVATIONS

ON

DIFFERENT KINDS

OF

AIR.

Printed for the Philoſophical Tranſactions, 1773, Vol. LXII.

By JOSEPH PRIESTLEY, LL.D. F.R.S.

LONDON,
Printed by W. Bowyer and J. Nichols.
M.DCC.LXXII.

PHILOSOPHICAL
TRANSACTIONS,
GIVING SOME
ACCOUNT
OF THE
Preſent Undertakings, Studies, *and* Labours,
OF THE
INGENIOUS,
IN MANY
Conſiderable Parts of the WORLD.

VOL. LXII.

LONDON:
Printed for LOCKYER DAVIS, in *Holbourn*,
Printer to the ROYAL SOCIETY.

M.DCC.LXXII.

1772

and on the air combined with various substances, in the autumn of 1772.

Oddly enough, Priestley's paper *was* published in a different form before the end of 1772, though rather too late and in too small an edition, I am certain, to have influenced Lavoisier at this time. Hoefer—alone of the sources I have consulted—makes mention of what he describes as a reprint of the *Observations:* "réimprimées à part; Lond., 1772."[6] Priestley himself makes no reference to it in his *Memoirs,* and neither do any of Priestley's biographers. It is not listed in the chemical bibliographies of Ferguson, Bolton, or Duveen (1949); nor is it included in the list of his publications appended to the sketches of Priestley in Poggendorff or the *Dictionary of National Biography* (by Sir Philip Hartog). Dr. John F. Fulton, who made a preliminary survey of printed works of Priestley in 29 libraries, does not record it.[7] I find no copy listed in the catalogues of the British Museum or of the Library of Congress; there is none in the Edgar Fahs Smith Memorial Collection at the University of Pennsylvania nor in the Library of the American Philosophical Society. It is, however, clearly described in the catalogue of the *Bibliothèque Nationale* and in that of the Surgeon General's Library. A copy from Benjamin Franklin's library is in the collection of the Historical Society of Pennsylvania. There is a well-preserved copy in the Evans-Rosenwald Collection, recently given to the Institute for Advanced Study (Princeton), where I first became aware of its existence and was able to examine it.

A careful perusal revealed that the pamphlet is identical in substance with the paper in the *Transactions* and convinced me that it is the separate to which Hoefer refers. It is a slim quarto, bearing the date 1772, printed by W. Bowyer and J. Nichols. The pagination does not correspond with the paper in the *Transactions:* the separate has an unnumbered title-page and numbered pages running from 3-120. Internal evidence shows that it could not have appeared until after 29 October 1772, for a postscript to a letter of William Hey to Priestley (p. 118) bears this date. Indeed, it could hardly have appeared before the end of November. A let-

[6] Hoefer, *op. cit.,* II, 477, note 2.

[7] John F. Fulton and Charlotte H. Peters, *Works of Joseph Priestley, 1733-1804: preliminary short title list,* New Haven, Laboratory of Physiology, Yale University School of Medicine, 1937, (20 pp., litho-printed). Dr. Fulton has recently instituted, at my request, a search in the extensive Priestley materials in the Yale Historical Medical Library, and informs me that no copy of the Bowyer-Nichols separate is to be found there. There is, however, a copy in the Rare Book Room of the Yale University Library.

ter of Priestley to Dr. Price, dated 11 November 1772, includes the following paragraph:

> I sent my papers for the Royal Society by a private hand on Tuesday last, (this day sennight,) to be delivered by Mr. Johnson to Dr. Franklin, and by him to be sent to Dr. Maty. I hope they have arrived, though I have this day received a letter from Dr. Maty, desiring me to send them as soon as I can get them ready.[8]

The tenor of Priestley's correspondence with Franklin and Price, and Priestley's exclusive scientific preoccupation in these months with his experiments on air, leave no doubt that he is referring to the *Observations*.

Now there is a possibility, despite the date on the title-page, that this separate did not actually appear until January or February 1773,[8a] but I do not think this is the case. It was clearly intended to appear before the next volume of the *Transactions* and is certainly an early instance of Priestley's impatience at the delays of publication through the Royal Society, which led him, as Hartog has shown, to bring out his subsequent researches in book form.[9] On the title-page of the "pre-print," as we may call it, is the statement that it was "printed for" Volume LXII of the *Philosophical Transactions*, 1773; and the mention of this year supports our inference that the volume of the *Transactions* in question, despite the date that it bears, did not appear in 1772. Yet there is evidence that Volume LXII had been at least partly set up in type before the pre-print appeared, for the latter contains the famous engraved folding plate, with the indication that it was to be inserted opposite page 252 of the *Transactions*, where it does in fact appear.

The publishers of the pre-print were William Bowyer the younger (1699-1777), "the learned printer," and John Nichols, his partner since 1766.[10] Bowyer was a close friend of Davis, the younger man who was bookseller to the Royal Society and at least

[8] J. T. Rutt, *Life and correspondence of Joseph Priestley*, London, 1832, 2 vols. (I, 185-6).

[8a] A copy of Priestley's *Observations on different kinds of air* was sent by Franklin to Benjamin Rush. See Franklin's letter of 14 February 1773 in the Library of the University of Pennsylvania, cited by Denis I. Duveen and Herbert S. Klickstein, "Benjamin Franklin (1706-1790) and Antoine Lavoisier (1743-1794). Part I" *Ann. Sci.*, 1955, *11*, 111 and note 54. This was almost certainly the "pre-print" which we know Franklin to have received, for a copy from his library is now in the rare book collection of the Historical Society of Pennsylvania, as the librarian of the Society has been kind enough to inform me.

[9] Sir Philip J. Hartog, "The newer views of Priestley and Lavoisier," *Ann. Sci.*, 1941, *5*, 26.

[10] For the Bowyers, father and son, and for Lockyer Davis, see the excellent articles in the *Dictionary of National Biography*.

nominally their printer. It is possible that Davis, preoccupied with the task of bringing out the *Transactions,* appealed to Bowyer, or sent Priestley to Bowyer, so that Priestley's results might appear without delay. But I think it more likely that the actual printing of the *Transactions* had been entrusted to Bowyer, who could strike off separate copies, merely changing the title-page and the pagination, once the paper had been set up for the Royal Society.

This rare pre-print is in any case the earliest form in which Priestley's classic paper appeared. By a convenient cancellation of errors, the date assigned by historians of science to the first appearance of Priestley's work is probably correct; but it is clear that the *Observations* did not, as is usually stated or implied, first see the light of day in the *Philosophical Transactions.*

Lavoisier and the French chemists are unlikely to have seen a copy of this pre-print; its rarity today suggests that the edition was extremely small, as would have been logical, since the paper was soon to secure wider circulation in the *Transactions.* Although we know that news of Priestley's reports to the Royal Society during the course of March 1772 reached France in the same month,[11] it was not until the appearance of Volume LXII of the *Transactions* in the spring of the following year that Lavoisier and his fellow-chemists could know at first hand what Priestley had accomplished.[12] There is good evidence to support this conclusion.

The interest of Frenchmen in Stephen Hales's "fixed air"[13] had been greatly stimulated by the publication in the Abbé Rozier's *Observations sur la physique* (issue of February 1773) of a summary of Jacquin's attack on Meyer's *acidum pingue* theory of

11 See the letter of Jean Hyacinthe de Magellan or Magalhaens (1722-1790) to the French chemist, P. J. Macquer (1718-1784), dated London, 20 Mars, 1772 (Bib. Nat., Fr. 12306, T. II. ltr 18). In this unpublished letter Magellan, a most important link between British and French scientists in this period, writes that they have continued at the Royal Society to read Priestley's "excellent Mémoire sur l'air fixe & le méphitique. . . ." This implies that Magellan had written Macquer concerning the earlier reports, but the other letters have not turned up. Priestley's reports were read on 5, 12, 19, and 26 March 1772.

12 So Fourcroy: "Mais bientôt tout changea de face à cet égard dès la publication de la première distribution de Priestley, publiée en 1772 à Londres, & qui ne fut connue que plus d'un an après à Paris." See the article "Chimie" in *Encyclopédie méthodique—chimie, pharmacie et métallurgie,* Paris, An IV, III, 412.

In his *Opuscules* of 1774 (Chap. VI) Lavoisier describes his experiments proving that air is absorbed during the calcination of metals (lead, tin, iron). These experiments were carried out late in March, 1773, as his entries in the laboratory *registres* indicate (Berthelot, *La révolution chimique,* pp. 235-7). It is therefore significant to find Lavoisier writing in a note appended to this chapter (*Oeuvres de Lavoisier,* I, 621): "Je n'avais point connaissance des expériences de M. Priestley, lorsque je me suis occupé de celles rapportées dans ce chapitre."

13 For this subject see my "Continental reputation of Stephen Hales," *Arch. int. Hist. Sci.,* 1951, no. 15, 393-404. The term "fixed air," used broadly by Hales, was applied restrictively by Joseph Black to the gas we call carbon dioxide.

causticity, and his defense of the views of Joseph Black;[14] and by the appearance in the same journal (issue of March 1773) of a translation of the first part of Black's *Experiments on Magnesia Alba.*[15] There is reason to believe that Lavoisier may have had a hand in these translations, and he doubtless read them before they were actually printed.

The subject of fixed air was first discussed at meetings of the Academy of Sciences in April and May 1773. On 24 April, in what appears to be the earliest session devoted to this subject, the gifted young chemist Jean Bucquet (1746-1780) reported on experiments he had performed in the laboratory of the Duc de la Rochefoucauld d'Enville on the properties of Black's fixed air, in order to ascertain (i) if fixed air is the same as ordinary atmospheric air and (ii) whether it is the same regardless of the source from which it is obtained.[16] This paper—the earliest original contribution on fixed air to be presented publicly in France—is prefaced by a review of the literature. Bucquet refers to Van Helmont, Boyle, Black, Macbride,[17] and Jacquin, but—significantly—makes no mention of Cavendish or Priestley. Yet on 12 June a report praising Bucquet's work, prepared jointly by N. Desmarest (1725-1815) and Lavoisier, begins its concluding paragraph with this sentence: "Quoique ces expériences aient beaucoup de rapport avec celles publiées avant

[14] *Observations sur la physique, sur l'histoire naturelle et sur les arts,* Paris, 1784 (quarto reprint ed.), I, 123-34.

[15] *Ibid.,* pp. 210-20.

[16] "Extrait d'un mémoire de M. Bucquet, etc." in *Oeuvres de Lavoisier,* I, 548-50.

In Roux's *Journal de Médecine* there appeared in the issue for May 1773 a short article by Hilaire-Marie Rouelle (who had succeeded his more famous brother, the teacher of Lavoisier, as "démonstrateur de chimie au Jardin du Roi"). This appeared just at the time that Lavoisier was presenting his own discoveries to the Academy of Sciences; Lavoisier reproduced this article without change in his *Opuscules* (Chapter XVII of the "Précis historique"; see *Oeuvres de Lavoisier,* I, 538-47). Rouelle shows himself familiar with the work of Hales, Macbride, Black, and Jacquin and with Priestley's *Directions.* He starts, in fact, from this work of Priestley—and that of Lane, reported by Priestley—in an effort to produce artificial ferruginous waters with the aid of dissolved fixed air. But just as his paper was completed he learned of the publication of Priestley's *Observations,* and he adds (*loc. cit.,* p. 547) the following note: "Je viens d'apprendre qu'il paraît depuis peu une dissertation en anglais de M. Priestley, dans laquelle on trouve une très-belle suite d'expériences sur l'air fixe, l'air inflammable et l'air méphitique ou de putréfaction. J'ai regret de ne l'avoir pas connue plus tôt: la manière dont sont faites les expériences que nous avons déjà de lui est un garant sûr de l'usage excellent qu'on peut faire de tout ce qui vient de sa main." The French translation of Priestley's *Observations* had not yet appeared, and Rouelle is reporting, probably by hearsay, what he had learned of the contents of the paper in the *Philosophical Transactions.*

[17] David Macbride (1726-1778), a physician of Dublin, was Joseph Black's earliest disciple. His *Experimental essays on medical and philosophical subjects* (Dublin, 1764) was published in a French translation in 1766 and aroused great interest. The translator was Vincent Abbadie. A copy of this book was in Lavoisier's personal library.

M. Bucquet et *surtout celles de M. Priestley,* elles n'en sont pas moins précieuses pour la physique."[18]

There was every reason why, by mid-June 1773, Priestley's work should have been known to the initiated: in the April issue of Rozier's journal, which apparently was not distributed until early May, there appeared not only the concluding sections of the translation of Black's *Experiments,* but the first part of a translation of Priestley's *Observations;* the rest of the Priestley translation was printed in the May issue which, by the same token, probably did not appear until early June.[19]

As we know, Lavoisier lost little time in familiarizing himself with Priestley's work, for a long summary of it appears in the historical section of the *Opuscules physiques et chimiques* (1774) on which he was at work in the summer and early fall of 1773.[20] It was the knowledge of Priestley's work that brought this book into somewhat premature existence. Indeed, just as Bucquet's paper—and the series of articles on fixed air appearing in Rozier's journal —may have impelled Lavoisier to present to the Academy the results he had been quietly accumulating since the previous September (it was on 5 May 1773 that he empowered the Secretary of the Academy to open his famous sealed note describing his earliest experiments[21]), so it seems that knowledge of Priestley's work led Lavoisier's colleagues in the Academy to urge him to bring his

18 "Rapport sur un mémoire de Bucquet sur l'air fixe," in *Oeuvres de Lavoisier,* IV, 155-8. The italics in the quotation are mine. Cf. *Procès Verbaux de l'Académie des Sciences, 1773, 92,* fol. 133.

19 *Observations sur la physique,* (edition cited), I, 261-75 ("Suite des expériences de M. le Docteur Black"); 292-325 ("Observations et expériences sur différentes espèces d'air; par M. Joseph Priestley"); 394-426 ("Suite des observations et expériences . . . par M. Joseph Priestley"). A review of the April number of Rozier's Journal appeared in the June issue of the *Journal Encyclopédique* (1773, IV, pt. 2, 220 ff.) with a three-page summary of Priestley's paper, beginning: "Les physiciens liront avec plaisir des observations & des expériences du docteur Priestley sur différentes espèces d'air, & dont nous connoissons les trois principales."

20 *Oeuvres de Lavoisier,* I, 512-35. In his appended note Lavoisier writes: "Ces expériences de M. Priestley ont été publiées en anglais à la fin de l'année 1771. . . ." This, of course, is a slip. In the text, indeed in the sentence to which the note refers, he speaks, quite correctly, of the "suite nombreuse d'expériences communiquée l'année dernière à la Société royale de Londres par M. Priestley." Since Lavoisier wrote this in 1773, his dating—not always reliable—is here correct.

21 *Procès-Verbaux de l'Académie des Sciences,* 1773, *92,* fol. 116 *v,* where the secretary writes: "J'ai ouvert en présence de l'Académie le dépôt No. $15\frac{8}{3}$ fait par M. Lavoisier le 2 9^{bre} 1772 et j'ai paraphé son écrit pour lui conserver la date."

It is of some interest that in the next entry (8 May 1773) the secretary records: "J'ai présenté à l'Académie l'exemplaire du mois d'Avril du Journal de M. L. Rozier." This issue, as we have seen above, contained the second part of the translation of Black's paper and the first part of Priestley's.

results out in book form as soon as possible. Fourcroy's testimony is valuable on this point:

> Jaloux de ne publier que des faits nouveaux [Lavoisier] . . . ne se pressa point d'abord de les faire connoître à mesure qu'il les découvroit . . . & c'est vraisemblablement forcé & en quelque sorte malgré lui, qu'il présenta à l'académie vers la fin de 1773 l'ouvrage annoncé [the *Opuscules*] qui contient le germe ou la première idée de toutes ses découvertes postérieures. Celui du docteur Priestley venoit de paroître en Angleterre; la vaste étendue de ses expériences, l'ensemble que le physicien anglois embrassoit, sembloit faire craindre aux amis de Lavoisier, qu'il ne fût prévenu dans beaucoup de points par Priestley, & qu'il perdît ainsi le fruit de ses travaux; ils le pressèrent de publier ses recherches, & Lavoisier céda à leurs instances, sur-tout à celles de Trudaine-de-Montigny, amateur éclairé, avec lequel il avoit répété une partie de ses expériences.[22]

And Lavoisier himself later wrote:

> Il y avait, à cette époque, une correspondance habituelle entre les savants de France et ceux d'Angleterre; il régnait, entre les deux nations, une sorte de rivalité, qui donnait de l'importance aux expériences nouvelles, et qui portait quelquefois les écrivains de l'une ou de l'autre nation à les contester à leur véritable auteur.[23]

Indeed a trace of this rivalry is to be found in a note appended by Lavoisier to his discussion of Priestley's work in the *Opuscules,* where he writes that "il y avait déjà du temps que je m'occupais du même objet, et j'avais annoncé dans un dépôt fait à l'Académie des sciences le 1er novembre 1772, qu'il se dégageait une enorme quantité d'air des réductions métalliques."[24]

One question, nevertheless, remains unanswered. If I have correctly described the sequence of events in this crucial period of Lavoisier's early career, and if he did not know Priestley's *Observations* at first hand until the late spring of 1773, how can we account for the inclusion of Priestley's misspelled name in the list of workers on fixed air he gave in the memorandum of 20 February 1773? I believe the answer is simple. Priestley, at this date, could only have been cited for a much less important work, his *Directions for*

22 *Encyclopédie méthodique—chimie, pharmacie et métallurgie,* III, 415. Trudaine de Montigny (1733-1777), a close friend of Lavoisier, had been made an honorary member of the Academy of Sciences in 1764; in this capacity he was vice-president of the Academy in 1772 and president in 1773. On this man and his friendship with Lavoisier see Ralph E. Oesper's "Priestley, Lavoisier, and Trudaine de Montigny," *J. chem. Educ.,* 1936, *13,* 403-12. For Trudaine's participation see Berthelot, *Révolution chimique,* p. 245. Trudaine was on the committee of the Academy which in September 1773 saw a number of Lavoisier's experiments repeated. See "Verification des expériences de M. Lavoisier, etc." (Bib. Nat. Fr. nouv. acq. 5, 153).

23 *Oeuvres de Lavoisier,* II, 103. The editor (Dumas) guesses that this undated paper may have been written in 1792.

24 *Oeuvres de Lavoisier,* I, 512, n. 1. This is the date of the sealed note; it was deposited with the Academy the following day. See above, note 21.

Impregnating Water with Fixed Air, which had been published in London in the summer of 1772[25] and which was almost immediately translated into French.[26] Though there was little in this pamphlet on artificial soda water to have directed Lavoisier's interests into new channels, and only a general reference to the fact that Priestley was at that time studying and discovering other sorts of air besides the "fixed air" encountered in the famous brewery, what we call carbon dioxide, it was natural to include his name in a list of those who had written on this mysterious elastic fluid. Because of the presumed medical value of "fixed air," which Macbride's work had seemingly established, Priestley's pamphlet was widely praised. The subject was considered at a meeting of the Royal College of Physicians, before whom Priestley demonstrated his method, and the discovery was recommended by that body to Lords of the Admiralty "as likely to be of use in the sea scurvy."[27] It played a part, though certainly not the principal part, as some have claimed, in the award to Priestley of the Copley Medal in the autumn of 1773.[28]

As early as February 1773 Lavoisier was clearly not citing Priestley for his *Observations,* as is usually supposed.[29] It does not seem to have been stressed that in his memorandum Lavoisier

25 See above, note 5. In a letter (London, 4 May 1772), Benjamin Franklin wrote to Priestley: "I think with you that there cannot be the least Occasion for my explaining your Method of impregnating water with fix'd air to Messrs. Banks and Solander, as they were present and I suppose are as well acquainted with it as myself: however, I shall readily do it, if they think it necessary. I am glad you intend to improve and publish the process." (A. H. Smyth, ed. *The writings of Benjamin Franklin,* V, 394.) This book had therefore not been printed when Franklin wrote, but the French translation was reviewed in Rozier's journal in the August issue (*Introduction aux observations sur la physique,* August, 1772, pp. 323-31). Obviously the work had been published in the interval. Priestley's dedication, in fact, bears the date: Leeds, 4th of June, 1772. A facsimile of the *Directions,* with an historical introduction by John J. Riley, was printed in 1945 by the American Bottlers of Carbonated Beverages, Washington, D. C.

26 Priestley's *Directions* had been sent to France through the agency of Magellan, and the translation was due to the efforts of Magellan's correspondent, Lavoisier's friend, Trudaine de Montigny (see *Introduction,* August, 1772, p. 323, note 1). Maurice Daumas has seen a letter of 14 July 1772, in which Trudaine asks Lavoisier to repeat Priestley's experiments on fixed air. See Daumas, *Lavoisier, théoricien et expérimentateur,* Paris, 1955, p. 28. This must refer to the *Manière d'imprégner l'eau d'air fixe,* and not, as Daumas seems to imply, to the more important work reported by Priestley to the Royal Society in March, which had not yet been published. But see above, note 11.

27 *Memoirs of the Rev. Dr. Joseph Priestley,* p. 57. See also T. E. Thorpe, *Joseph Priestley,* London and New York, 1906, pp. 77-80.

28 See above, note 5. But compare the portion of Sir John Pringle's address to the Royal Society on the occasion of the award of the Copley Medal (November, 1773) given in Thorpe, *op. cit.,* p. 80, and in J. M. Stillman, *Story of early chemistry,* 1924, pp. 481-2. Prof. John Winthrop of Harvard, to whom Benjamin Franklin had sent a copy of the *Directions,* deemed it a "very important discovery." See I. Minis Hays, ed., *Calendar of the papers of Benjamin Franklin,* I, 145. Franklin was one of those instrumental in obtaining the Copley award for Priestley. See Franklin's letter of recommendation of 1773 mentioned by Duveen and Klickstein, *loc. cit.,* p. 111, and note 52.

29 See for example Hartog, *loc. cit.,* p. 29.

shows himself not only undecided as to whether the air that is fixed in various substances is the same as common air, as Hales believed, or whether it is "another substance, to which they [Joseph Black and his followers] have given the name of 'fixed air,' " but also quite unaware that Henry Cavendish and Joseph Priestley had already shown there were other elastic substances differing both from ordinary air and from Black's "fixed air." Had he known of the work of Cavendish (published in the *Philosophical Transactions* in 1767), or of Priestley's recently published separate, with the significant title of *Observations on Different Kinds of Air,* Lavoisier's view of the problem would have been quite different. The chemical opinions he summarizes make it quite evident that at the time he wrote the memorandum Lavoisier knew of Priestley's work on gases only through the *Directions for Impregnating Water with Fixed Air* and that he had not seen the classic paper of Cavendish, whom he does not mention.[30]

Finally, this little analysis can, I think, be used to settle once and for all a disputed point concerning Lavoisier's much-discussed February memorandum. As all historians of chemistry are doubtless aware, the original bears the date 1772; but a generation ago A. N. Meldrum quite persuasively argued that Lavoisier was guilty of a familiar clerical slip, so common at the beginning of a new year, and had written 1772 when he meant 1773.[31] Though Meldrum's emendation was widely accepted—for it conformed to what we know of the chronology of Lavoisier's work, which the date Lavoisier actually wrote did not—doubt has recently been cast upon it.[32] But Lavoisier's reference to Priestley is conclusive. As early as February 1772, Priestley had published *nothing* concerning fixed air, and his name would never have been included in such a roster as Lavoisier gives. Meldrum's conclusion would seem to be confirmed.

30 Cavendish's paper (*Phil. Trans.*, 1766, *56*, 141-84) was cryptically mentioned in France soon after its appearance, in a summary of the contents of this volume of the *Transactions* that appeared in the *Journal Encyclopédique* (1767, VII, pt. 3, 90-103). Here we read: "Cet article est composé de trois mémoires contenant diverses expériences faites sur l'air factice, par M. Henri Cavendish, Membre de la Société Roy. Ces expériences nous ont paru très-ingénieuses; mais nous les rendrions mal sans le secours des planches." This early reference to the paper seems to have been without influence.

31 Meldrum, *Eighteenth century revolution,* pp. 7-13. See above, note 3.

32 By Maurice Daumas in his review of Douglas McKie's *Antoine Lavoisier* in *Arch. int. Hist. Sci.*, 1953, no. 22, p. 125; and more recently in his *Lavoisier, théoricien et expérimentateur,* Paris, 1955, p. 27.

The Contributions of Benjamin Rush to Veterinary Medicine

J. F. SMITHCORS*

EVEN a casual study of the life and work of Benjamin Rush reveals hardly a facet of colonial and post-revolutionary culture in which he did not demonstrate some interest. Among his manifold interests was his advocacy of veterinary education, a sidelight of his rich life which has received only the briefest notice by medical historians. In urging the study of the diseases of domestic animals by medical students and physicians, Goodman credits Rush with being "the earliest proponent of the study of veterinary science in America."[1] The lack of attention to this subject prior to 1800 appears to be due to a set of circumstances peculiar to America.

Colonial America had its physicians and had asserted its independence in medical education by the establishment of the Medical School of the College of Philadelphia in 1765. Despite the interruptions of war, several additional schools of medicine had been founded by 1800. Beginning with scattered contributions in the eighteenth century, a soon-to-be voluminous medical literature found its fountainhead in the *Medical Repository* in 1797. A number of colonial physicians already had become world figures in medicine. Colonial America early recognized its need for physicians, and whether graduate or nongraduate, the doctor was an important man in the New World.

Colonial America had its livestock, too, all of it brought to the New World by the settlers themselves. The Indians had no domestic animals; the colonists found none save the turkey domesticable. The first animals brought to America probably were well attended because of their scarcity and the difficulty of replacement; in some areas they multiplied so rapidly as to become a nuisance. Swine were brought to Jamestown in 1609; by 1627 the settlers were obliged to palisade the community to prevent being overrun with them. Europe had been a reservoir for animal plagues for centuries, but in America animals had found a pest-free haven—for long enough to allow their owners to forget that they might have

* Michigan State University, East Lansing, Michigan.

1 Goodman, N. G. *Benjamin Rush: physician and citizen.* Philadelphia, University of Pennsylvania Press, 1934. 421 pp. (p. 136)

some obligation in these matters. By 1800 a number of serious outbreaks of animal disease had occurred among the several species of livestock, chiefly around the larger centers of animal population. But up to this time not a single graduate veterinarian had set foot upon these shores. While a number of self-educated farriers undoubtedly plied their trade, only one had asserted himself to the extent of producing an original work; in 1795 Paul Jewett published *The New England Farrier.*

In the early 1800's the Philadelphia Society for Promoting Agriculture, through the efforts of its learned president, Judge Richard Peters, began publishing accounts of animal disease. It is doubtful that anyone with less perception than Peters would have found between the lines of these reports a sense of impending disaster facing the adolescent livestock industry. Europeans had not concerned themselves with the idea of veterinary education until it was forced upon them by the increasingly harsh ravages of animal plagues which threatened the entire livestock population. The first veterinary school was founded at Alfort, France, in 1762. In spite of pleas by far-seeing, public-minded Englishmen, many of them medical men, Britain did not see the need for a veterinary school until 1792. In America, no one before Peters seems to have given the idea more than a passing thought.

In 1806 the Philadelphia Society offered a gold medal "for the best essay and plan, for promoting veterinary knowledge and instruction, both scientifically and practically, under the circumstances in our country."[2] The fine hand of Peters, who was a close friend of Benjamin Rush, may be seen in the framing of the announcement, for the wording of the accompanying statement leaves little doubt that the society expected to "rouse the attention of medical professors." The statement continues:

> While agriculturalists are employed in the production of plants, their stock of useful animals are abandoned, when diseased, to all the calamities attended on ignorance of their maladies, or cure. Pretenders and empirics, of the most contemptible character, prey on the necessities and credulity of those who are compelled to apply to them on this subject. . . .
>
> Who is there among the most respectable of our own citizens, or in the highest grades of society in the world, who has not deemed it meritorious to promote the interests of agriculture? And is there any branch of that occupation so important, as that now recommended to the notice and inquiry of medical men? If it has held an inferior rank in the classification of science and knowledge, it is entirely owing to the unmerited neglect with

[2] Peters, R. Veterinary essay and plan. *Memoirs of the Philadelphia Society for Promoting Agriculture,* 1808, *1,* xliv-xlvi.

which it has been unaccountably treated. It is time it should be rescued from obscurity, and placed among the most commendable and necessary branches of medical education.[3]

In Europe, it is understandable that veterinary medicine should have been a subject beneath the notice of the average physician or surgeon. While veterinary and human medicine had flourished side by side in ancient times, the separation between the two disciplines had become absolute during the twilight of the Byzantine era. With animal medicine securely in the rough-and-ready hands of the farrier and cow-leech, there was little left of the once fundamental identity of veterinary and human medicine. In America, however, many rural physicians forgot their hereditary antipathy for animal medicine and treated animals and man without discrimination. Undoubtedly many of them came to grips with the inescapable fact that a medical education did not always supply them with the necessary weapons for this guerilla warfare. What is remarkable is the number of eminent physicians, foremost among them Benjamin Rush, who recognized the need for veterinary education at a time when livestock owners did not see beyond the confines of their own barnyards and pastures. Undoubtedly there were occasions when they lamented the lack of qualified medical care for their stock, but no one had raised the issue of how this problem should be met.

In compliance with the request of the Philadelphia Society, on 2 November 1807, Rush addressed the medical students of the University of Pennsylvania upon "The Duty and Advantages of Studying the Diseases of Domestic Animals, and the Remedies Proper to Remove Them." It is perhaps more than a little significant that Rush expected veterinary medicine to develop at first along with human medical study. While he did "lament the want of a veterinary institution in this country," he apparently acted in accordance with the desires of the Society for a "practical" approach to the problem by urging medical students to study the diseases of domestic animals, for "In vain will be the efforts of public bodies and private individuals to disseminate veterinary knowledge in our country, without a provision for regular and oral instruction upon it."[4] Rush apparently did envision the establishment of a veterinary curriculum as such, for he adds,

[3]*Ibid.*

[4]Rush, B. The duty and advantages of studying the diseases of domestic animals, and the remedies proper to remove them. *Memoirs of the Philadelphia Society for Promoting Agriculture*, 1808, *1*, l-lxv.

> From the public spirit of the trustees of our University, and particularly from their disposition to promote every branch of science connected with medicine, there is reason to believe, that it is only necessary to lay before them the advantages of a veterinary chair, in order to insure its establishment. . . .
>
> I have lived to see the medical school of Philadelphia emerge from small beginnings, and gradually advance to its present flourishing condition; but I am not yet satisfied with its prosperity and fame, nor shall I be so, until I see the veterinary science taught in our university.[5]

The University of Pennsylvania did establish a school of veterinary medicine, but not until 1884, seventy-one years after the death of Rush. In keeping with the tradition Rush might have wished to father, the school was established largely through the efforts of the eminent Philadelphia physician, Rush Shippen Huidekoper, who became its first dean.

While Rush also foresaw the possibility that veterinary medicine might develop in conjunction with agricultural education, and not without profit to both, it is in some respects unfortunate this did become the pattern for the development of most of our veterinary schools. Beginning as veterinary science departments of agricultural colleges, and designed to render a necessary service to agricultural interests, most of our veterinary schools had to evolve without the guidance of experienced medical educators and the salutary stimulus of a medical climate.

Although his "veterinary" lecture is not included in his *Selected Writings,*[6] nor does it appear as such in an extensive bibliography of his works (Gminder[7]), Rush did include it in a volume of introductory lectures published in 1811,[8] and it appears in the form of fragmentary lecture notes in his *Autobiography.*[9] It would therefore be unjust to conclude that he had stepped outside his sphere, if that were possible, in complying with the request of the Philadelphia Society. While he mentions the "motive impressed by the recommendations of that society in their premiums," it seems most unlikely that his compliance was anything but one of sincere interest in the matter. Few men in any walk of life have before or since Rush demonstrated so cosmopolitan and enlightened an interest in the affairs of man. That his convictions on the

[5] *Ibid.*

[6] Rush, B. *The selected writings,* D. D. Runes, *ed.* New York, Philosophical Library, 1947. 433 pp.

[7] Gminder, Gwynneth. An exhibit of the life and works of Benjamin Rush, M.D. *Bull. Hist. Med.,* 1946, *19,* 96-112.

[8] Rush, B. *Sixteen introductory lectures.* Philadelphia, 1811. 455 pp.

[9] Rush, B. *The autobiography,* G. W. Corner, *ed.* Princeton, Princeton University Press, 1948. 399 pp.

subject of veterinary medicine were not of a neoplastic nature is demonstrated in his earlier writings. Rush had studied comparative anatomy at Edinburgh under Alexander Monro, *Secundus,* and in his *Lectures on Animal Life*[10] in 1799 he had expounded upon the values which medicine might derive from the lower forms of animal life. And in a lecture upon *The Progress of Medicine,*[11] in 1801, "enumerating the causes which have retarded the progress of our science," he states,

> 1st. The first cause, that I shall mention is, connecting it with such branches of knowledge, as have but a slender relation to it. . . .
>
> 2nd. The neglect to cultivate those branches of science, which are most intimately connected with medicine. These are chiefly, Natural History, and Metaphysics. In the former, I include, not only botany, zoology, and fossilology, but comparative anatomy and physiology. . . .[12]

Along these lines of his own philosophy, Rush stated in his "veterinary" lecture,

> The science of medicine is related to everything. A mere physician, that is a physician who knows nothing but the sciences which are supposed to belong exclusively to his profession, is a non-entity. To deserve that title in its extensive import, it is necessary for us to know something of the principles and practice of every art and pursuit of man. . . .[13]

That Rush understood the differences as well as the similarities of human and animal diseases is evident from his lengthy description of specific symptoms of certain animal maladies. An advantage in studying the diseases of animals is that

> . . . the number of their diseases is more limited, and their symptoms are more obvious, for they are not multiplied, nor complicated by intemperance in eating or drinking, nor are they under the influence of passions which suspend or alter them, and in some instances, prevent their evolutions.
>
> The seats of their diseases, moreover, are more perfectly known from the greater facility of dissecting and examining their bodies after death.[14]

In keeping with the title of his lecture, Rush mentions the moral obligations as well as the practical advantages of a study of the diseases of animals. He urges that

> We are bound in the first place, to discharge the important duties to domestic animals which I have mentioned, by the relation that has been established between them and us by the author of nature. . . . They live only for our benefit . . . so that there is constantly due, to them, an immense

[10] *Op. cit.* (note 6), pp. 133-80 (Lectures on animal life, 1799).
[11] *Ibid.*, pp. 227-44 (The progress of medicine, 1801).
[12] *Ibid.*, p. 227.
[13] *Op. cit.* (note 4).
[14] *Ibid.*

balance of debt from us. . . . By studying the diseases of domestic animals we may rescue them from the hands of quacks, who add, to the mischievous and unsuccessful efforts of nature, the evils of absurd, painful, and destructive remedies.[15]

One of the veterinary works in widest circulation at the time was the American reprint of Taplin's *Gentleman's Stable Directory*, which qualified contemporary evidence had characterized as "verbose quackery" and as "pompous and illiterate impertinance . . . inconsistence, blunder and contradiction." All too frequent examples of the absurd practices mentioned by Rush persisted until the enlightening influence of veterinary education came to be felt late in the nineteenth century. One such practice, which appears in a *Horseman's Friend* (!) of 1871, advocates for founder (metastatic inflammation of the horse's foot), bleeding until the horse falls, followed by turning up the foot and pouring boiling lard over it. Such practices may not have been typical of the time, but a horse so treated would find little solace in the fact that other horses were handled with greater humanity.

Concerning the practical advantages to be derived from a study of the diseases of domestic animals, Rush says, "It is our duty and interest to attend in a more especial manner to the health of those domestic animals which constitute a part of our aliment, in order to prevent our contracting disease by eating them. . . ."[16] His statement in this regard appears to be the first public recognition, in America, of the interrelation of certain human and animal diseases which included a practical solution to the problem. In a sense he anticipated a function of boards of health to which little thought, and less action, had been applied. It was not until 1884, when the Bureau of Animal Industry was established as an adjunct of the Department of Agriculture, that Rush's concept was implemented upon a national basis.

Rush also urged the study of animal disease from a sense of duty to the nation and its citizens, saying,

The products of agriculture and commerce are often lessened by a fatal epidemic, brought on by diseases which blast the character of animal provisions; and many poor families have been left to suffer all the evils of penury and famine, by the death of a single horse, upon whose labor, of a cow upon whose milk, or of a hog upon whose flesh, they had relied exclusively for subsistence; all of whom perhaps perished by diseases that might have been cured.[17]

[15] *Ibid.*
[16] *Ibid.*
[17] *Ibid.*

It is perhaps as difficult to realize as it is unpleasant to contemplate that in a pioneer society the loss of a single animal was frequently a greater hardship than the heartbreak over the loss of a child. Callous though it may seem, a child was replaceable; often an animal was not. A plague which killed large numbers of animals in a frontier community was a real calamity which stripped away the thin veneer of civilized comfort afforded by the work or food potential of the wealth represented by domestic animals.

In speaking to a group of medical students, it is logical that Rush should include a reference to the advantages accruing to medicine itself from a study of animal disease, a subject he had alluded to in his previous writings:

> By extending our knowledge of the causes and cure of the diseases of domestic animals, we may add greatly to the certainty and usefulness of the profession of medicine, as far as it relates to the human species. . . . there is scarcely a form of disease mentioned in our systems of nosology, but what is to be met with in domestic animals. . . . By acquiring this kind of knowledge, you will add to the resources of medicine as far as it relates to the human body.[18]

In summary, he adds,

> I have then gentlemen, laid before you a brief detail of the obligations we owe to our domestic animals, and the reciprocal advantages to be derived from extending to them, the benefits of the science of medicine. In performing this task, I have endeavored to become the organ for the dumb, and a suppliant for creatures that are unable to plead for themselves. Permit me to recommend the subject to your attention in your future studies. . . . Take care of the health of domestic animals.[19]

What the impact of Rush's plea for the study of veterinary medicine may have been is perhaps too subtle to determine. Certainly nothing as concrete as his determination to see "veterinary science taught in our university" came about in his lifetime, nor for long years afterward. As influential as he was in the affairs of the university, and the nation as well, public opinion had been too long one of indifference to the necessity for veterinary education. On the other hand, Rush's address apparently did stimulate the thinking of leading agriculturalists. John S. Skinner, editor of the *American Farmer,* not only reprinted Rush's address,[20] but made repeated pleas of his own for the establishment of veterinary schools. Like Rush, he advocated the inclusion of veterinary instruction in the medical curriculum until veterinary schools

[18] *Ibid.*
[19] *Ibid.*
[20] *American Farmer,* 1822, *4,* 243-6.

should come into being. In addition, he fostered the reprinting in America of the leading veterinary works of Britain. Another physician, James Mease, delivered the first of "A Course of Lectures upon Comparative Anatomy and the Diseases of Domestic Animals"[21] before the Philadelphia Society in 1813. Mease actually worked in the field of comparative pathology for some thirty years and is noted for his pioneering work on Texas fever of cattle. Perhaps as an indirect result of the efforts of Rush and Mease, Robert Jennings, a student at the Pennsylvania Medical College of Philadelphia, delivered a series of veterinary lectures to his fellow students from 1846 to 1850. In 1850, with the aid of a group of medical men of Philadelphia, Jennings organized the short-lived Veterinary College of Philadelphia.

The contributions of Benjamin Rush to the early history of veterinary medicine in America are little known in either the veterinary or the medical profession. Except for the recent works of Myers[22] and of Bierer,[23] it is likely that Rush's efforts in behalf of veterinary medicine would yet be in limbo. During the somewhat belated awakening of interest in the history of veterinary medicine, one of the first obligations would seem to be to establish the identity of the first friends of the veterinary profession. The record leaves little doubt that Benjamin Rush was the first of a series of medical men who attended its prenatal stages. Along with Klein, we gratefully acknowledge that "In all the subsequent years no one has presented a better argument for the study of veterinary medicine."[24]

21 Mease, James. Introductory lecture. . . . *Memoirs of the Philadelphia Society for Promoting Agriculture,* 1814, *3,* xix-lxix.

22 Myers, J. A. *Man's greatest victory over tuberculosis.* Springfield, Ill., C. C Thomas, 1940. 419 pp.

23 Bierer, B. W. *A short history of veterinary medicine in America.* East Lansing, Michigan State University Press, 1955. 113 pp.

24 Klein, L. A. *History of the School of Veterinary Medicine of the University of Pennsylvania.* Philadelphia, Veterinary Alumni Society, 1935. 226 pp.

A Symposium on Trigeminal Neuralgia

With Contributions by Locke, Sydenham, and other Eminent Seventeenth Century Physicians

KENNETH DEWHURST*

Lysetta: "What will you do, sir, with four physicians?
Is not one enough to kill any one body?"
Molière, *L'Amour Médecin*, Act II, Sc. 1, 1739.

DURING the night of 4 December 1677 Dr. John Locke was called from his bed to attend the Countess of Northumberland, wife of the British Ambassador to France, who was stricken with severe spasms of right-sided facial pain in all respects resembling tic douloureux. Some months previously she had suffered a similar exacerbation of pain which her French physicians had failed to relieve by extracting two teeth from the affected side; and now in desperation she dismissed her foreign advisers in favour of Locke who had ceased to practise medicine five years previously on his appointment as Secretary of Presentations to Lord Shaftesbury. But although Locke was no longer an active practitioner, he had had a thorough grounding in medicine: first as a general practitioner in Oxford, later as Sydenham's collaborator and physician to the Shaftesbury family. Although subsequent fame as a philosopher completely overshadowed his medical activities, Locke's interest in his original calling never waned, and throughout the whole of his long life he was always ready to treat patients and give advice.

John Locke was educated at Westminster School and Christ Church, Oxford, where he was successively lecturer in Greek, rhetoric, and moral philosophy. In 1666, after completing part of the Oxford medical course (but before he graduated), Locke set up as a general practitioner in Oxford as partner to Dr. David Thomas. "Mr. Thomas presents his humble service to you," writes Locke to Boyle in February, 1667. "He and I are now upon a new sort of chemistry; that is extracting money out of the scholars'

* Littlemore Hospital, Oxford.

pockets, and if we can do that, you need not fear but in time we shall have the lapis; for he that can get gold and silver out of scholars cannot doubt to extract it anywhere else."[1]

During his Oxford practice Locke was asked to procure some medicinal waters for Lord Ashley (afterwards Earl of Shaftesbury) and, as a result of this meeting, they soon became firm friends. Later, Locke was appointed physician to the Ashley household, and shortly after his arrival in the metropolis he sought out his old school friend, Dr. Mapletoft, who was then physician to the Northumberland family. Mapletoft introduced Locke to Thomas Sydenham who had recently published his revolutionary book on the diagnosis and treatment of fevers, in the second edition of which work Locke contributed a poem in praise of the author's methods. The friendship between Locke and Sydenham soon blossomed into active collaboration. In 1668 the latter wrote to their common friend Robert Boyle: "I perceive my friend Mr. Locke hath troubled you with an account of my practice as he hath done himself in visiting with me very many of my variolous patients especially."[2] In addition to helping one another in general practice, Locke and Sydenham planned a joint treatise on smallpox: and amongst the Shaftesbury papers are a number of essays bearing their joint contributions. The most notable of these is Locke's essay "De Arte Medica,"[3] written in 1669 and intended as an ambitious historical survey of "the faculty of Medicine as it now stands in reference to Diseases and their Cure." This fragment has been reproduced and expanded by Dr. A. G. Gibson[4] who states in his introduction that the "author had an insight into the healing art based on first hand observation of the daily problems of practice, and had he been able to complete it, it might have formed as notable a contribution to the philosophy of medicine as the Essay did to that of the Mind." Other uncompleted and unpublished essays are two on respiratory diseases: "Tussis,"[5] written in English, probably in collaboration with Sydenham, and "Respirationis Usus,"[6] in Latin. In a longer essay headed "Anatomica"[7] Locke is at pains to point out that, although anatomical studies are of some

1 Boyle, Robert. *Works*, London, 1774, vol. V, p. 567.
2 *Ibid.*, p. 465.
3 Shaftesbury Papers, P.R.O. 30/47/2.
4 Gibson, A. G. *The physician's art: An attempt to expand John Locke's fragment De arte medica*, Oxford, Clarendon Press, 1933.
5 Shaftesbury Papers, P.R.O. 30/47/2.
6 *Ibid.*
7 *Ibid.*

use to a surgeon, a detailed knowledge of this subject is of limited value in clinical practice. At the top of the manuscript the following sentence is inserted in Sydenham's handwriting: "Others of them have more pompously and speciously prosecuted the promoting of this art by searching into the bowels of dead and living creatures, as well sound as diseased, to find out the seeds of discharging them, but with how little success such endeavours have been and are like to be attended, I shall here in some measure make appear."

Whilst Locke was physician to the Ashley household he gained a wide experience of clinical practice as is evident from his diaries and notebooks. One of these, *Observationes Medicae*,[8] has been published by Dr. E. T. Withington,[9] and an English translation has appeared in the *Medical Magazine*,[10] which includes over twenty detailed case histories of patients with such diverse complaints as dropsy, quartan ague, rheumatism, lichen, hysteria, bronchitis, dyspnoea and oppression in the chest, pleurisy, and gonorrhoea. There is also an account of the illness of W. Sydenham, aged eleven (son of Dr. Thomas Sydenham), who was suffering from measles. Locke gained his most dramatic success during this period of practice in the treatment of his patron who was stricken with what Pepys described as an "imposthume in his breast." Sir William Osler,[11] who published a full account of Locke's notes on Lord Ashley's illness, diagnosed his lordship's malady as a chronic hydatid abscess of the liver. Locke saved his patron's life after opening his abdomen (by means of a caustic) and introducing a silver tube through which the pus drained away.

When Shaftesbury became Lord Chancellor in 1672, Locke was persuaded to exchange his duties as household physician for affairs of state, still in the service of his patron. Throughout these years of practice Locke had no medical qualifications, for in spite of a recommendation by Lord Clarendon (then Vice Chancellor of Oxford University) he was unsuccessful in his supplication for the degrees of M.B. and M.D. It was not until 1674, six years after his election to the Royal Society, that Locke became a bachelor of medicine. Presumably he had by that time fulfilled the meagre requirements of the Oxford medical course. This course demanded regular attendance during three years at the lectures of the pro-

8 Addison MS 5714, British Museum.
9 Whithington, E. T. *Janus*, 1899, *4*, 393-8, 457-63, 527-32, 579-87.
10 *Med. Mag.*, 1898, *7*, 47-50, 375-87, 573-9.
11 Osler, Sir William. *An Alabama student and other biographical essays*, London, *Oxford Univ. Press*, 1926. (Reprinted from special issue of *Lancet*, 20 Oct. 1900.)

fessors of Arabic, anatomy, and medicine; participation in a certain number of disputations, presence at the dissection of one human body and at four lectures, each of two hours, upon it.

According to Lady Masham, Locke's indifferent health prevented him from continuing practising medicine as a whole-time career. "Mr. Locke applied himself principally to physic," she writes, "a science which he yet never afterwards made use of to his profit, as not being well able to bear the fatigue those must undergo who would bring themselves into any considerable practice, and as having no need of this whereby to live at his ease. But though he professed not the practice of physic, his judgment was always of great weight with the ablest physicians of his time."[12] Nevertheless, as late as 1677 it is evident that Locke still regarded himself as a physician, as in that year he made known his intention of becoming a candidate for the Gresham Professorship which his friend Dr. Mapletoft spoke of resigning. Also his diary for 1679 contains detailed notes on the treatment of his friend Mr. Banks, and in spite of referring to himself in 1692/3 as "one who wishes well to the practice of Physic though he meddles not with it," he was called in consultation by King William III five years later.

It was for reasons of health that Locke travelled to France in the winter of 1675 and two years later whilst residing in Paris, he was called to attend the Countess of Northumberland. Her malady seems to have puzzled him. After applying a local anodyne, he immediately wrote an accurate and detailed account of her illness to Dr. Mapletoft who was then professor of physic at Gresham College. His letters contain the first description of trigeminal neuralgia in Europe, and the subsequent correspondence gives the views of the leading physicians on its treatment.

Mr. Locke to Dr. Mapletoft. Paris, 4th December, 1677.

Sir,

I never had a more unwelcome occasion of writing to you now, believing I can scarce send you more unacceptable news than that of the illnesse of a person whom not only you and I, but all the world have soe just reason to esteeme and admire. On Thursday night last I was sent for to My Lady Ambassadice, whom I found in a fit of such violent and exquisite torment, that (though she be, as you know, a person of extraordinary temper, and I have seen her even in the course of this distemper endure very great pain with a patience that seemed to feele noe thing) it forced her to such cries and shrieks as you would expect from one upon the rack, to which I believe hers was an equal torment, which extended itself all over the right side of her face and mouth. When the fit came, there was, to use My Lady's own ex-

12 Bourne, H. R. Fox. *Life of John Locke,* vol. I, p. 197.

pression of it, as it were a flash of fire all of a suddaine shot into all those parts, and at every one of those twitches which made her shreeke out, her mouth was constantly drawn on the right side towards the right eare by repeated convulsive motions, which were constantly accompanied by her cries. This was all that appeared outwards in these fits according to the exactest observation I could make, having had but too many opportunitys to doe it. These violent fits terminated on a suddaine, and then My Lady seemed to be perfectly well, excepting only a dull pain which ordinarily remained in her teeth on that side, and an uneasienesse in that side of her tongue which she phansied to be swollen on that side, which yet when I looked on it, as I often did, had not the least alteration in it in colour, bignesse, or any other way, though it were one of her great complaints that there was a scalding liquor in her fits shot into all that half of her tongue. She had usually a presention of the fit by a little throbing upon her gum of the lower jaw, where she had this summer a tooth drawn; and a like throbing in the upper jaw, just over against it. In all this time of her being ill she has not found the least pain in all the other side of her face or teeth, which hath soe wholly possessed the right side that it went even to the very tip of her tongue, and the last tooth before on that side. With all this torment that she endur'd, when the fit was over there was not the least appearance of any alteration any where in her face, nor inflammation or swelling in her mouth or cheeke; very little destruction of rheum, more than what the contraction of those in these fits might cause. Speaking was apt to put her into these fits; sometimes opening her mouth to take anything, or touching her gums, especially in the places where she used to finde these throbings: pressing that side of her face by lying on it were also apt to put her into fits. These fits lasted sometimes longer, sometimes shorter; were more or less violent, without any regularity and the intervals between them at the longest not halfe an hower, commonly much shorter. At night when I was cald, I saw noe roome for any thing else to be done but to endeavour to give her present ease by topical anodyn applications to those parts of her gums where the first beginnings of her fits appeare, which had soe good an effect that that night she had two or three howers rest together without any fits, besides some other little intervalls of sleepe. But the next day the fits returning, tho' not altogether soe frequent and violent as they had been, yet bad enough to make us feare they might, I thought it necessary to purge Her Honour, for besides that I saw noe indication for bleeding. My Lady had beene soe often and soe much bleeded on the like occasion this sommer, without any reliefe, that there was little to be hoped from it, and I thought it ought to be very waryly made use after soe much taken already. The purge wrought seven or eight times, the fits continuing still by intervalls after her purge; soe at night, as you know is usuall, she tooke a quieting cordial. The first part of the night she had her fits very severly, but the latter part hath been more favourable, and 'till about nine or ten of the clock that I write this, there remains only an ordinary tooth acke, the violence of those fits being ceased; but whether we are not to apprehend their returne in this extraordinary case I cannot be over confident, two or three days of ordinary tooth acke having preceeded them.

I wish with all my heart you were here, both to assist My Lady by your better skill, and to ease me of a part of that sollicitude I am under, haveing the care of a person of her consideration wholy upon me; she haveing had soe little successe with the French physitians here this summer, in the like case, wherein for eight days togeather their applications did her noe good,

that she is resolved to trie them noe more. If I durst interpose my opinion in a case soe extraordinary as this, I should aske whether you did not thinke this to proceed from some affections in the nerves in the place where the tooth was drawn, which draws all the rest into consent and convulsive motions on this side, and that perhaps some sharpness in her blood may contribut to it. I beg your opinion, and of whoever else of the ablest of our physitians you shall think fit to consult with, but I wish much more for your company, than your opinion without it.

I am, Sir,
Your most humble Servant,
JOHN LOCKE

There is some mixture of vapours I also apprehend with the other symptoms. My Lady Harvey thinks it very convenient Dr. Scarburgh should be consulted, and certainly you cannot consult an abler man.

I beg your pardon for my ill writing, it is in haste and in feare. The weather here is very cold."[13]

In the afternoon of the same day Locke sent another letter to Dr. Mapletoft, giving him account of his patient's progress.

Mr. Locke to Dr. Mapletoft. Paris, 4th December, 1677.
At one in the Afternoon.

You will certainly thinke me in great distraction, when after a letter and note that I sent you already this morning, I now send you this third. But it is to tell you, that My Lady upon a little increase in her paine, apprehending the violent returne of fits, hath since the writing of my last note, had a blistering plaster put on her neck [interscrapulus]. In a little fit she had since, the violence of the pain not being soe great as it usually is, she had the liberty to shew me her tongue, which she had some reason to imagine swollen, all the left side of it being drawn up dureing the fit, and soe seemed thicker as if it were swollen; but as soon as ever the fit is over, it returnes to its natural state, and there is noe discernable difference between the sides of it, nor the least impediment in My Lady's speech, or alteration in her voice. She has, especially when the fits are most violent, a drinesse in her lips more than ordinary.* It may not perhaps be amisse to let you know also, that during all the pain and disorder My Lady has suffered, her temper has been as good and her pulse as equall, sedate and regular, as that of any one in the best health, only sometimes the violence of her pains puts her into a little sweat, but as soon as that leaves her, she returns presently to her ordinary good temper. I am willing you should know as much as I doe of all the circumstances of her case. And I should be glad you knew better what would perfectly cure it, tho' I wish heartily it may be over before your answer come.[14]

I am, Sir,
Your most humble Servant,
JOHN LOCKE

* And My Lady Harvey tells me, that several unusual drieness of her lips, she apprehended she should have them, she having particularly observed this symptome to accompany those fits she had in the summer.

[13] Locke, J. *European Mag.*, 1789, *15*, 185-6.
[14] *Ibid.*, p. 187.

The next day Locke was able to report some improvement in his patient's condition in the following letter.

Mr. Locke to Dr. Mapletoft. Paris, Sunday night, 5th December, '77.

Sir,

I wish this would make so much hast as to come to you before ill news I sent you yesterday; at least, I hope it will not leave you long under that paine which I know you will be in till you receive better. It is therefore with great satisfaction that I tell you, that not withstanding My Lady's feares yesterday, upon a little returne of some, though not of the violent sort of fits, and my apprehension (for who in soe extraordinary a person, would not apprehend all things) it hath pleased God soe to blesse those things My Lady hath used, that she had very good rest the last night and her sleepe, which nature itself voluntarily offer'd, was very seldome interrupted by any pains that made her complaine. The progresse of this day hath not been unsuitable to the precedent night. My Lady continues to get ground upon the distemper, which now, for the most part, is not much more than the grumbling of the tooth-ach, with now and then some shootings, which reach now but from that part where the tooth was formerly drawn to the fore teeth on that side; soe that I hope by the next opportunity I shall be able to send you word that she is perfectly well. I beg your pardon for the many faults in my yesterday's writing, which hast and hurry made me commit; for both my letter and myself being cold for whilst I was writing the first of the three, I was affraid I should misse the post, and I was faine to mudle up things with lesse method and order than was necessary in such a case. But since I hope it will be of noe ill consequence to My Lady, and that the businesse will be over before your advice can arrive, I promise myself your excuse and favourable interpretation.

I am, Sir,

Your most humble Servant,

JOHN LOCKE

Notwithstanding these present good circumstances, yet I continue my request to you to hasten away the best advice you can send me, whatever may happen; for one cannot be too well fortified against such an enemy, who hath already made more than one assault, and after a cessation returned.[15]

Locke's letters to Mapletoft were shown to three leading physicians, Dr. Micklethwaite, Sir Charles Scarburgh, and Dr. Dickinson, all of whom gave their advice. A fourth physician, Thomas Sydenham, who was destined for greater fame than any of them, was secretly consulted by Mapletoft as his novel views on medicine in general, and the treatment of fevers in particular, were still unaccepted at that time.

[15] *Ibid.*, p. 273.

Gresham College. 3rd December, '77.

Sir,

Upon the receit of your two letters dated December 4th (for the Third you mention came not to my hand), My Ld. commanded me to advise with the new President, Dr. Micklethwait, Sir Charls. Scarburgh, and Dr. Dickinson, the result of whose thoughts upon My Ladys case I send you inclosed in their own hands, all which are left to your discretion and skill to manage as you think best. I am very glad to find that you have been so successful allready as your last, which I received this day, acquaints us to the great joy of those that honour My Lady and love you, and that you are like to have so little need of Auxiliarys I herewith send you—When you have preserved my humble duty to My Lady I desire you to lett her know that I read your last letter this morning to My Lady E. Percy who had the good fortune you wished me, to heare of My Ladys recovery before she did of that extremity she had been in, of which I afterwards gave her some account. I write you no news save what you will not, I believe, receive from other hands and you are a little concerned in, viz. that on St. Andrew's Day which was Friday last, Sir Joseph Williamson was chosen President of the Royall Society, Dr. Grew and Mr. Hook Secretarys (Mr. Oldenburgh being dead as you have heard I presume) and Mr. Hill Treasurer in the room of Mr. Colwall, who had held it eleven yeares and yet brought never a foot of Land either in Parnassus or elsewhere. My Ld. [Brownlow] was not present being lame of the gout. An Annull choice, they say, is like to be kept up and a new one every yeare to be chosen. Sir Joseph had twenty nine votes and My Lord only thirteen. Pray be so kind as to require this little piece of news with what will concern us both more, the health of our Honoured Lady of which I desire an account, if you please by the next opportunity. My Service, I pray, to the good Dr. and his wife to whom I wish a good houre if it were not past already. When you look on this you find you have no great need to make excuses for ill writing, and for the future I will abuse you that line upon another of your pardon which I shall allways need but never mean to ask more, nor to need upon any other occasion as being, Sir,

Your most Faithfull humble Servant,

JOHN MAPLETOFT[16]

The opinion which follows was written by Dr. John Micklethwaite, who was the President of the Royal College of Physicians. After reading medicine at Leyden and Padua, Micklethwaite was recommended in 1644 by the Long Parliament for appointment as physician at Bart's, "in place of Dr. Harvey, who hath withdrawn himself from his charge and is returned to the party in arms against Parliament." Micklethwaite was also physician to Charles II, by whom he was knighted.

Upon consideration of ye case of the Most excellent Lady soe very well started, it seems clear that the blood is not at fault, but some pungent vapor which affects ye nerve to qualifie wch. is a great Business. I doe not apprehend any necessity of bleeding and but little of purging wch. in case of vapours will rather aggravate them: but if by reason of ye antecedent cause

[16] Mapletoft, J. (1677) MS. Locke, C.15, fol.213-214, Bodleian Library.

it be thought necessarie, it must be done by such purges as make for least comotion in ye humours and best lack of ye accriomie—consideration being had to such as usually have best agreed with Her Honour heretofor. . . . [Then follows a long and elegant prescription for a purge of which the main ingredient is calomel.]

But because ye pain is most urgent it will be necessarie to give opiates inwardly and apply little sponges or linnen dipt in syrup of castor and liquid laudanum to the part pained and apply large blisters under ye eare and under ye armpit of ye side affected, and if these may be gott, ashes of ye bark of ash and put them into a very fine cloth and dip it in vinegre and bind it to the place you would blister it many times. Raise a blister in ½ to ¼ of an hower. This decoction is also good: . . . [Then follows a long prescription in which the principal ingredients are redii hyoscyamine, pyrethrum and coryophylleru.]

After a while held in ye mouth spit it out. I would commend to Her Honour the frequent use of sage powder as often as Her Lady can get it down. Let Her Honour have a care of all things that sharpen ye blood or raise vapours. And lastly I desire Her Ladyship to make an issue in ye Arme of that side she is most afflicted. I pray God Almighty add his blessing.

JOHN MICKLETHWAITE

November 30, '77.[17]

Dr. Edmund Dickinson, who gives the next opinion, had practised for many years in Oxford where he met Theodore Mundanus, a celebrated alchemist. Largely on account of his dexterity as an experimenter, Dickinson was later appointed one of the physicians-in-ordinary to Charles II. The King was greatly interested in chemistry and had his own laboratory where Dr. Dickinson was wont to design experiments for His Majesty's edification.

When his opinion was sought, Dickinson was living at Denham and shortly afterwards he retired from practice in order to devote his time to philosophy and alchemy. Evelyn, the diarist, visited Dr. Dickinson and recorded this impression: "I went to see Dr. Dickinson, the famous chemist. We had a long conversation about the philosopher's elixir, which he believed attainable and had seen projection himself, by one who went under the name of Mundamus, who sometimes came among the adepts, but was unknown as to his country or abode; of this the doctor has written a treatise in Latin, full of very astonishing relations."[18]

3 December, '77

Dolor convulsive.

Sir,

From the Hystory of the Symptoms I conceive the distemper of the Right Honorable the Countess of Northumberland is not of a Sanguinevus, but Nerval kind; and does depend partly on the weakness of the Nerves

[17] Micklethwaite, J. *Ibid.*, fol. 217-218.
[18] Evelyn, J. *Diary*, London, 1680, vol. II, p. 375.

traversing to the left side of the Face and partly on the pravity of the Nerval juices.

The weakness of those Nerves seems to have its origin from the tearing of some Nerves in the drawing of a tooth on the side.

The pravity of the Nerval matter may be occasion'd by the dyserary of liver or spleen. The same ill-condition'd matter was formerly the occasion of the frequent difficulty and shortness of breathing to wch. Her Honour hath bin far too much inclined.

The relief is to be attempted by strengthening of the weak'ned Nerves; and by altering of the deprav'd matter in them.

For the strengthening of the Nerves I recommend the use of the Queen of Hungary's water [a distillate of rosemary], by bathing that side of the Face of her with it; and by often holding some of it in the mouth. Acqua Lavendula composita may be used the same. I prefer the Hungary Water if well made, being an efficacious, if a more sweet and cleanly remedy. For the altering and sweating of the acid and Sharpe matter in the Nerves, I propose the use of Beroardicum minerale made according to the prescription of it by Hartman and Schroder—which being rightly made is a pleasant and efficacious remedy—8 or 10 grains of it given every night at bed time, and (at the least) two houres after a light Supper in two spoonfulls of Cowslip and Sage Water equally mixed, another spoonfull being drank uppon it. This remedy is to be continued a good while.

The Nerves will be the sooner strengthened and the matter in them better altered if it be lessened by a clyster behind the eare on the weak side wch. must be kept running as long as may be. I have in the like case made an Issue behind the Eare and have seen it very effectuall.

And if some proper Purgation, if it be made once in a month (or oftener as need shall be) by the Resin of Jalop or Scammony finely powdered and mixed with a spoonfull of the Syrup of Violets, or Cowslips fifteen graines of either of them (more or less according to Her Honour's strength) may be soe given.

E. DICKINSON[19]

Sir Charles Scarburgh, whose opinion follows, was First Physician to Charles II (by whom he had been knighted in 1664) and also a Censor of the Royal College of Physicians. He had been educated at St. Paul's and Caius College, Cambridge, where he had devoted his energies to the study of mathematics and medicine: the latter as the business of his life and the former as the best preparative thereto. Scarburgh remained a Royalist during the Civil War and was deprived of his Cambridge fellowship, whereupon he migrated to Merton College, Oxford, then presided over by Dr. Harvey. The latter befriended Scarburgh and later bequeathed to him "my velvet gowne . . . and all my little silver instruments of surgerie."[20] Scarburgh's letter, in which he recommends such medical measures as the application of leeches to the

[19] Dickinson, E. (1677) MS. Locke, C.15, fol.215-216, Bodleian Library.

[20] Munk, W. 1861 *Roll of The Royal College of Physicians,* London, 1861, 2 vols. (vol. I, p. 252.)

gums, temples, and behind the ears, cupping with scarification, cauterising of the gums, purging, and making "issues" behind the ears, would suggest that he was rather fond of using these "little silver instruments of surgerie."

Novemb. ye 30th, 1677.

Sr.,

The Case of the Countess of Northumberland which this morning we read togeather, although it be extraordinary, yet I have several times met with the like, though not in all points the same.

Undoubtedly some peculiar disaffection of the nerve of that part from whence the tooth was drawn is a great cause of those sharp and scalding pains, though not the only one, for that Her Honour was before much vexed with the toothach. So that the main original is seated in the Blood and Nerval juices. The applications of vesicutories in the paroxysm was proper and necessary, and ought to be as near the part affected as may be. As upon the vertebraes of the neck and back and chiefly behind the ears and so downwards along the sides of the neck as large as may be conveniently made, and kept running as long as well can be. And indeed those behind the ears may be continued from time to time in the nature of an issue, and very likely to a considerable benefit. Besides in the extremity of a fitt Cupping glasses may be used, either with scarification or without. Also leeches to the gumme it self, which is very often found a present relief. If these prevail not, the last and I think most sure remedy is to cauterize the gumme down to the very bottom, where the tooth was fixed, and, upon its drawing, the nerve lacerated, or otherwise offended, perchance by a fissure of the Loculus of the tooth. The way of cauterizing is by such a kind of instrument as is frequently here used in the cauterizing of the Tonsills of the throat and without any offence to the adjacent parts. This Sir is the Summe of what at present I can think most useful in respect of the part it self. For as to other applications of ointments ol. succini outwardly, or waters proper to be taken into the mouth upon these convulsions which the Letter mentions, I think needless to prescribe to that gentleman now attending, and of such excellent knowledge and judgement. For it cannot be certainly determined whether not cephalick waters as Aq. Lavendulae comp. Aq. Paomiae comp. Tinct. Castores or the like may agree, though they are commonly used and relieve the brain and nerves in convulsions. Yet I should advise to make use of such by way of gargle, either simply by themselves or else diluted with milder waters at discretion. Now for the temporating of the blood and humours of the body, I conceive a constant diet drink to be necessary after this kind of form: . . . [Then follows a prescription in which the main ingredients are sarsaparilla, with red and white sandalwood.]

Besides purgations at reasonable times will be convenient. And because I suspect that in this case much may be Hysterical I should advise such a sort of familiar: Rx pil. aloes rosat. Pil Aggregat. galbani colatri gr. ix Castorei pul. gr.ii ol succini chym. gutt.

Lastly issues are to be considered if this malady continues. And because bleeding hath been often administered with little or no success, I dare not at this distance pronounce any wayes concerning it. Only I think that Leeches may be safely applyed to the Temples and behind the ears in extremities. Worthy Sir, this is all at present I can with safety and reason say

in a case but once related to me, and concerning so honorable a person to whose state of body I am wholy a stranger, yet always an honourer of herself and family, and most ready to serve Her Ladyship to my utmost.

Sir, I am Your most humble Servant,

CHARLES SCARBURGH[21]

When Locke sought his opinion on Lady Northumberland's illness Thomas Sydenham was still struggling to get his views accepted by his more conservative colleagues. He was then fifty-three (eight years older than Locke) and was practising in Pall Mall next to the "Pestle and Mortar," the shop of Mr. Malthus, his apothecary. Sydenham's path through life had never been smooth; and in the letter which follows he refers to "those poor people whom my lott engages me to attend (for I cure not the rich till my being in the ground makes me an authority)."

Shortly after entering Magdalen Hall, Oxford, Sydenham's studies were rudely interrupted by the Civil War, in which he served the Parliamentary cause as a Captain of Horse. He graduated bachelor of medicine in 1648, two years after his return to Oxford, and was elected a Fellow of All Souls shortly afterwards. But again his Oxford residence was interrupted by army service: this time he fought in Scotland with the Cromwellian army which opposed the landing of Prince Charles. After a short period of study at Montpellier, Sydenham became a licenciate of the Royal College of Physicians and set up in practice in Westminster where he made Locke's acquaintance through their common friend Dr. Mapletoft.

It is clear that Sydenham's advice on Lady Northumberland's illness is neither better nor worse than that of his contemporaries. The most that can be said of his treatment in this particular case is that it was less drastic than that of some of the other physicians. But Sydenham's reputation does not depend so much on his skill as a therapist (although he introduced tincture of laudanum into general practice, helped to lower the mortality from smallpox by his cooling regimen, and popularised quinine for treating the ague) as upon his detailed study of the natural history of disease by simple observation: it was upon this basis of sober empiricism that Thomas Sydenham led the medical profession back again to the Hippocratic concept of "the healing power of Nature," and caused Locke to hail him as "one of the master builders, at this time, in the commonwealth of learning."

[21] Scarburgh, C. (1677) MS. Locke, C.15, fol.219-220, Bodleian Library.

Dear Dr.,

At your earnest request I have thought on the case of the Lady, the formes of whose distemper I doe not judge to be any ulcer or any venemat quality else upon the gum (whaere it may be supposed some laceration of a nerve was made by that operation) but to be a hystericall quality in the bloud discharging its selfe entirely upon that place and side, where occasion was given by the drawing of the tooth, together with the payne of the operation and the apprehension thereof; for all the eare's to be contracted, after the mañer of a clonus in the head, or that other distemper like it, of a violent and exquisite paine about the temporall end which is wont to come and goe and may, as a clonus, be covered with a shilling.

As to what is to be done, I commend that bleeding and purging are iñediately contraind . . . in that they encrease the tumult in the part and both are absolutely necessary in respect of beginning the quieting and settling those vapors which otherwise very often will not admit thereof, as I know by certaine experience, but after such evacuation easy quietness will doe it. Wherefore were she one of those poor people whom my lott engages me to attend (for I cure not the rich till my being in the ground makes me an Authority) I would take the following course. I would take 8 ounces of bloud from the arme of the affected side. The next morning would give the following pills. Rx. pil. coch. ʒ i mercurius. dulc. gr. xv, resiad Zalepij gr. iiij, balsemi Peru. gutt. iij. sumat mane—not stirring out of her bedd that day. That night quiett not with Laud. liq. but with Mathews pills, they being much better in that they cause a [illegible] the next morning, and soe a profitable discharge. The same I would give every night for 3 weekes. The dose is from 14 to 18 graines and are as soft as butter. I would keepe her to milke and water, watergruell, roasted apples and such like fleshless diett for 8 or 10 dayes, to destroy the ferment the sooner. Take heed of irritating the gum, but rather in extremity of paine lett her hold a pledgett imbued with some dropps of laudanum liq. keeping it between the teeth halfe an houre and then taking in on the palate till her payne cease, which will not be long. If she hath bin allready sufficiently purged, to bleed only may be sufficient, and then to come to quieting. When she is out of the fitt lett her guard agaynst the impulse of the disease upon the jawes, by dabbing them with raggs wett with Planten water wherein hath bin dropped spirit of vitrioll to make itt a little sharp, which by its astrictionness will defend the part from the deflux better than any thing else; but this must not be done till she hath bin a petty while well of her fitts. This is my opinion, of which make what use you please. I am very affectionattly,

Yor. humble servant,

THO: SYDENHAM[22]

A footnote was added to Sydenham's letter in Dr. Mapletoft's handwriting, from which it would seem that, either the leading physicians had no desire to be associated with him in consultation, or, that his advice was not appreciated by people of rank and fortune. Whatever the reason for consulting Sydenham in secret, it is clear from the next letter that Locke held him in high esteem and valued his opinion.

22 Sydenham, T. *Ibid.*, C.19, fol.164.

I thought it not best to mention these our friend's directions for reasons you may know, yet believ'd you would not be displeased to have his opinion in a case of this difficulty and concernment, which you may make use of as you find cause. I have sent by Mr. Hill ℥i of Mathew's Pill, which I have superscribed Philon. Angl. ℥i and directed to you. If you think the name will prejudice the advise you may take it upon yourselfe. He advises also a Galbaru plaster to the navell.

Mr. Locke to Dr. Mapletoft.

Paris. 22 December, '77.

Having gotten another little parcel of time before the post goes, I cannot but tell you, upon reading our friend's letter [Sydenham], I was ready to cry out, The spirit of the Prophets is upon the Sons of the Prophets; I haveing in what I have done here not only proceeded by the same method, but used the very same remedys he directed as to the maine; for besides pil. cochia and mercurius dulcis, which was the purge I used, though I had not phil. Anglic., yet by adding some volatile salts to laudan. I provided for sweating. Bleeding I should perhaps have used in another patient: but it not being necessary here, I forbore soe much as to mention it, and that upon severall considerable reasons. For prevention, I like mightily the plaintain water and spirit of vitriol. I had proposed to My Lady something to the same intentions before, which was often washing mouth and gums, her temples, eyes and behinde her ears with cold water: this I thought likelyer to harden and strengthen the nerves and parts than any of those hot oyles and spirits which are commended, and which I cannot but think likelyer doe harme than good in this case. Indeed I had not thought of any acid spirits in the water; and perhaps the feare of irritation hindered me from thinking beyond soft innocent spring water; for he that had seen her in these fits, and how touchy the parts were upon almost any application (for there was but that one which he mentions which did not upon triall provoke a fit that I saw) would be apt to apprehend any thing that was pungent; but since I read it in his letter I have reflected on it, and thinke it the most proper thing that can be used. I have proposed also a totall abstinence from wine, light suppers, and early going to bed, and great care of taking cold; which I thinke is not to be donne by keeping herself very warme (which in my opinion is the readyst way to get colds), but by being and exercising frequently in the aire; and as means to obleige her to that, as well for its owne sake, I propose the taking a slight dose of Goddard's drops, viz. gr. vi every other morning, and walking after it in the open aire, or at least as often as the weather should be reasonable for such walking. This I thinke might strengthen the genus nervosum. For however I am fully satisfied that hystericall vapours joyn in to increase the tumult and disorder in the nerves on that side, and that I believe the drawing of those two teeth, especially the last, hath injur'd some nerve, and soe makes it very apt to be provoked, and draws its neighbours into consent; yet by what My Lady has informed me, since the violence of her pains have been over, I have reason to suspect there is an ancienter fault in the nerves of that side: and I know not whether an excrescence she has on the [illegible] on that side may not occasion or contribute to it, considering what communication there is between the nerves and glandules, this fault in that glandule being of an ancient standing. For having asked her diverse questions concerning her teeth a great way backwards, she told me that she hath heretofore, long before any of these fits, been frequently troubled with extreme violent itching

in her gums on that side (which she hath had now since the fit is gon) and sometimes twitchings, which seem to me to be from some fault in the nerves, or succus nervosus, which you please, on that side. I have proposed also the avoiding the evening aire about sun seting, and at least an hower after, which I thinke very apt to cause defluxions; and I suspect what would cause an ordinary tooth-ach in another, or heretofore in My Lady, will put her into these fits. I desire you two to consider of these things togeather, and give me your opinion upon these, and your advice if any thing else that you can thinke on, as probable to secure as much as may be the future. Pray remember me very kindly to him [Sydenham] for I am both his and your very affectionate friende and humble servant.

JOHN LOCKE[23]

Gresh. Coll.
Jan. 10, 77/8.

Deare Sr.,

I had not presently an opportunity of speaking with our Friend [Sydenham], to whom I have shewed both your Letters to which he only answers that you are in a very good way and ought to prosecute what you so rationally design. I am glad to heare the good news of My Ladys health confirmed by later accounts, and we entertain hopes of her being shortly with child. . . .

JOHN MAPLETOFT[24]

Locke's accurate and detailed account of trigeminal neuralgia is the earliest European description of that affliction, although Avicenna, the Persian physician, described a somewhat similar condition five centuries earlier under the name of "Levket" or "Taturu Ovis," a twitching of the face.[25] Whether Avicenna's account actually refers to trigeminal neuralgia is uncertain; and it was not until 1756 that Nikolaus André recognised the malady, which he called "tic douloureux." Even later, in 1773, when Dr. John Fothergill read a paper before the Medical Society of London entitled "Of a Painful Affection of the Face," trigeminal neuralgia was rarely recognised in England as the author had seen only fourteen cases in the course of his long and extensive practice.[26] Following the publication of this paper, "Fothergill's Disease" became a recognised entity due (according to the author) to "a cancerous acrimony" on account of the persistence, severity, and incurability of the pain. Had our philosopher-physician troubled to publish his notes on the Countess of Northumber-

23 Locke, J. *Op. cit.* (note 13), pp. 273-274.

24 Mapletoft, J. (1678) MS. Locke, C.15, fol.221.

25 Harris, W. (1937) *The facial neuralgias*, London, 1937, p. 13.

26 Fothergill, J. Of a painfull affection of the face. *Medical Observations and Inquiries*, 4th ed., 1776, 5, 129-42.

land's illness, trigeminal neuralgia might well have been recognised a century earlier and more aptly described as "Locke's Disease."

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The Ideal Doctor as Depicted in Ancient Hebrew Writings

DAVID MARGALITH*

IN Talmudic sources one does not find any medical treatises or descriptions of physicians or their practices which had been written for their own sakes. Many of our great sages practised medicine and specialized in anatomy, physiology, epidemiology, and surgery since a thorough knowledge of these subjects was essential to answer ritual and judicial questions. However, in some places in the Talmud there is reflected the high moral standard ascribed by our sages to the medical profession and the strong demands made upon physicians. Here are a number of instances:

"My son, should you fall sick, place yourself in the hands of a doctor, for this is his calling and God has given him of His wisdom." (Ben Sira, 38.)[1]

". . . 'And he shall heal' [Exodus, 20, 19]—that is to say, the doctor has been allowed to attend to the sick (and one should not say 'The Almighty has inflicted the wound and shall the doctor be able to heal?')" (Rashi's [1040-1105] commentary—Berakhot 60; Baba Kama, 85.)[2]

Ben Sira says: "God has grown medicines from the soil and the wise man shall not abhor them. Therewith the doctor heals the wound, the chemist makes up the prescription." (Bereshit Rabba, 10.)[3]

". . . The Almighty has created healing substances to grow from the earth, and the wise man knows their functions." (Ben-Sira, 30.)[1]

". . . The Doctor who heals free of charge is worth nothing; the doctor who comes from afar [one who is not well acquainted with the patient and his disease] is like a blind man." (Baba Kama, 85.)[2]

* Tel Aviv, Israel.

1 The book "The Wisdom of Yeshua (Jesus) Ben Sira" was written in the third century B.C. It was not included in the Holy Scriptures, but the Talmud quotes from it very often and bases its arguments upon it.

2 Berachot, Baba Kama, Taanit, Sanhedrin etc. These are treatises in the Talmud Bavli (Babylonian). The Talmud was begun about 200 years B.C. and was completed in the sixth century A.D. There is also a Talmud Yerushalmi (of Jerusalem) which was compiled in Eretz Israel at about the same time.

3 These are commentaries on the Pentateuch, chapter by chapter. They were compiled at the time of the Talmud.

". . . A doctor comes to a sick man and says to him: 'Do not drink cold drinks, and do not lie in a humid place, this you shall eat and that not . . .' But when a doctor sees that the patient is in mortal danger and will die anyhow, he should say to him and his family: 'Let him eat anything he wishes'; however, the man who can be cured should be taken good care of." (Shemot Rabba, 30, Vayikra Rabba, 33.)[4]

". . . Should a woman have a difficult delivery, the child is cut up in her womb and taken out limb by limb, for her life comes first. However, if most of the child has come out, it may not be harmed—for one life should not be sacrificed for another." (Ohalot, 7, 6.) In other words, so long as the child is as yet unborn, the mother's life should be saved and the baby's sacrificed; but when he is almost completely out in the world, he should not be touched, in accordance with the sublime maxim: 'One soul shall not be sacrificed for another.'

". . . Should a woman die in labour (on Sabbath), a knife shall be taken and her belly cut and the child taken out." ('Arakin, 7.)[5] The new interpretation here was firstly that the Sabbath was violated and the mother's body operated on in order to save the living child which had not yet been born, and secondly that mutilation of the corpse was no deterrent and it was operated on, for life (that of the unborn child) is sacred.

". . . He who goes out to be killed is given frankincense to drink to confuse his senses." (Sanhedrin, 43.)[6] This was merely a humane gesture, as explained by Rashi, "so that he may not worry, thus prolonging the suffering of being killed."

While explaining a certain sentence in the Scriptures (Deuteronomy, 32, 10—'He found him in a desert land, and in the waste howling wilderness; he led him about, he instructed him, he kept him as the apple of his eye'), the Zohar[7] quotes a wonderful description of the healing activities of a pious and benevolent doctor. In view of the interest in this extract we reproduce it here in translation:

"In connection with this sentence (Deuteronomy, 32, 10) it is written in the Book of Kratnae [some regard this name as a mis-

4 See note 3.
5 See note 2.
6 *Ibid.*
7 "The book of Zohar" is the basic work of Cabbala, which according to tradition is ascribed to Rabbi Shimon Bar Yohai (about 150 A.D.). There is, however, evidence that it was first published by Rabbi Moshe De Leon, a Cabbalist who lived in France in the fourteenth century.

nomer for Hippocrates] the Physician:[8] The wise doctor should take the following measures in attending to a patient who is the King's prisoner. He should pray for him to the Creator, since the doctor has found him 'in a desert land,' that is to say, suffering from diseases and a prisoner. What should the doctor do? He should analyse the causes and devise means of removing from the patient all things that may be harmful to him; he will bleed him to draw the 'bad blood' from his body; he will examine him in order to find out what has caused the disease and what will prevent its aggravation. He will then 'keep him as the apple of his eye'—he will take good care of the patient with the aid of such medicines and cures as are required. And he shall make no mistakes, for should he err but once, the Almighty will regard it as if he had shed blood and killed his patient; for the Almighty's wish is that even though a sick man be in prison he should nonetheless have someone to intercede for him and help him to secure his release.

"The Lord in Heaven passes sentence on all mortals—for life and death; some are punished by being maimed or penalised financially. He who has deserved corporal chastisement falls sick and is not cured until he has suffered the full measure of the punishment meted out to him. And a man who is punished financially and has disbursed the full amount imposed on him, is then cured and released from prison. The doctor should therefore see to it that the patient should pay the penalty and be freed.

"A man who has deserved to be flogged, is arrested and imprisoned until he has received a flogging all over his body and occasionally only on some parts of his body, or even one member only. Then he is freed. He who is sentenced to death may not escape this penalty even should he pay high ransom or all the money in the world. For this reason the wise doctor should make an effort on his behalf; if he can heal his body—well and good; if not, he should try to cure his spirit. Such a doctor will be rewarded by the Lord in this world and the next.

"Rabbi Elazar said: I have so far not heard of such a doctor or of that book. But once upon a time I was told by a certain Ishmaelite, who had it from his father, that in his father's time there lived a doctor who by just looking at a patient would be able to foretell whether the man would live or die. It was said about him that he was a saintly, god-fearing man, and when a poor patient came to him he would buy the medicines for him as well as any

[8] This is the only place in ancient writings where the physician Kratnae is mentioned.

other necessities. They used to say of him that there was no other doctor like him in the world. And his prayers were even more effective than the work of his hands. It seems to me that the doctor referred to here is the one mentioned by that Ishmaelite. It is certain that he is in possession of that doctor's book, as he had inherited it from his father. All that is written in that book is based on secrets from the Torah; it contains many mysteries and wonderful medical tracts. He used to say, however, that only a god-fearing doctor may make use of these. Everything contained in that book was perfectly clear as it stipulated precisely what a pious man may and what he may not do.

"Rabbi Elazar said: I had this book with me for twelve months and I found in it sublime enlightenment. When I came across the mysteries in the book, I called the Jew named Rabbi Yossi Ben-Yehuda and gave the book to him. Some of the mystic cures I found in this book were based on secrets from the Torah, and I am convinced that they had been written in sanctity and prayer and repentence toward the Lord. The doctor had transmitted the secrets from the Torah and extracted from them medical secrets, the like of which I have never seen. And I said: Blessed be our God who imparts of His divine wisdom to human beings." (Zohar, part 3, 299.)

That was a portrait of the righteous, god-fearing doctor, to whom may be entrusted the body and soul of the sick man imprisoned by Divine Providence, so that he may save him from damnation.

Our sages were loud in their praise of a certain 'craftsman' (a blood-letter used to be called a craftsman) whose name was Abba Umana.[9] About him it is said: "Abba Umana daily received greetings from the Heavenly Assembly. But what were his good deeds that brought him such reward? This is what he used to do: When he was blood-letting he would seat the men apart and the women apart. And he had a special garment in which he kept a sharp horn for blood-letting. When a woman came to him to be bled, he would put that garment on her and she would wrap herself up, so that none should look at her (to prevent immodesty). Also he had a hidden place where his customers would put their coins. He who

[9] The name Abba Umana is apparently derived from the word "Uman" (craftsman), used in the Talmud for a blood-letter, and the title "Abba Umana" indicates that the man was an expert at blood-letting, e.g. ". . . the father of all such as handle the harp . . ." (Genesis, 4,21.). For the word Umman (blood letter) see Preuss, J., *Biblisch talmudische Medizin* (Berlin, 1911), pp. 36-9; for Abba, see the same, pp. 38-9.

had one would place it there in payment for the blood-letting and he who had not was not shamed. And when a scholar happened to come to be bled, he would take no fee from him. Moreover, if he saw that a man had nothing to eat after the blood-letting, he would give him a coin and say to him: 'Go and eat.' " (Babylonian Talmud, Treatise Taadnit, 21.)[10]

These few excerpts paint a clear picture of the medical profession in its ideal form.

We have seen two model, god-fearing doctors who have reached the peak of life eternal: (i) the righteous Abba Umana, who was extremely strict about modest behaviour by men and women and was also very decent towards his patients in money matters so that a poor man should not be shamed; (ii) Kratnae, the divine doctor, who had been entrusted with the execution of verdicts pronounced by the Heavenly Court—monetary fines, physical disability, and death sentences. The doctor may never err, for he may pay with his life for any mistake. The sick prisoner is a trust placed in the doctor's hands by divine providence, and the doctor answers for the life of that prisoner. Indeed, the responsibility is tremendous.

Happy is the man who can stand up to such demands and can with a clear conscience compare himself with Kratnae and Abba Umana.

[10] See note 2.

Statistics on Sickness as a Cause of Poverty

An Historical Review of U. S. and English Data

ANTONIO CIOCCO AND DOROTHY PERROTT*

MUCH attention is given and has been given to the existence of an association between certain social conditions and the occurrence of specified diseases. Textbooks on diseases usually mention whether or not a specific disease occurs more or less frequently in one or another income group, in one or another social, ethnic, or other subdivision of the community. Similarly, textbooks on social problems usually mention which mental or physical disabilities are found more frequently with certain forms of social disorganization. Winslow[35] well summarized the general views on income level and disease when he stated: "What we can say with certainty is that poverty and disease are related and that in this relation we face a major challenge."

While the existence of such a relation is generally accepted, little has been done to elucidate its meaning. With a few notable exceptions which will be mentioned later the acceptance of this relationship has not even proven too helpful in developing indigent medical care programs aimed at the reduction of poverty, in increasing knowledge about disease reactions or about the processes that lead to reduction in economic status and the need for public assistance.

The incongruity revealed by the acceptance of the health and socio-economic status relationship and the inability to draw from such relationship any significant practical and theoretical consequences has led us to review the historical development of the acceptance of this relationship, to examine the data on which such acceptance is based, and to determine whether or not these data are at all adequate to offer some clue to the nature of the relationship and to its significance for community action, particularly for the medical care of the indigent. In this first paper we shall present and discuss pertinent data and ideas on sickness as a causative element of poverty as they have appeared in publications in this country and in the United Kingdom. In a second paper we plan to present facts and views on poverty as a factor in disease.

* Department of Biostatistics, Graduate School of Public Health, University of Pittsburgh.

IDENTIFICATION OF SICKNESS AS A FACTOR IN POVERTY

Allusions to the "rich" and the "poor" are found in all literature, and the moral value of giving assistance to the poor has always been stressed. Daniel said to Nebuchadnezzer the King, "Redeem thy sins with alms in money to the poor," and "as water extinguishes fire, so alms extinguish sin." From its inception, the Christian Church defined charity as one of the three major virtues, and St. Chrysostom echoed[27] the words of Daniel when he said, "If there were no poor, the greater part of your sins would not be removed: they are the healers of your wounds."

In Ancient Greece and Rome there were public physicians who provided medical care for those who could not afford to pay for it, and from the earliest days of the Christian era hospices were established for weary travelers by churches and monasteries, since most settlements or towns in the early Middle Ages had no inns to provide shelter for pilgrims and refugees. Apparently, many of the travelers were sick and poor because before long we hear that the hospices became a refuge for beggars, cripples, widows, and orphans. In these hospices, which were community enterprises, the poor received food and simultaneously the sick were treated, and shelter was given to orphans, foundlings, and travelers.

From these hospices, as we know, were derived both the hospitals and the hotels. The late René Sand[27] explains the changing functions of the hospices as follows:

> During the twelfth, thirteenth and especially the fourteenth centuries, the rural population expanded and prosperous towns grew up; inns for travelers became commonplace in the West. From then onwards, hospices gradually ceased to function as hostelries and instead admitted the sick in increasing numbers. Hospices were founded or adapted for the reception of special categories—the blind, orphans, and foundlings, reclaimed prostitutes and especially old people.

Thus we see that long ago it was recognized that sickness and need for community assistance occur together. This recognition, however, was more like the perception that water extinguishes fire than the identification of a relationship between combustion and presence of oxygen. Expressed identification of sickness as a factor in poverty becomes first evident when the community took over from the church the entire responsibility for the care of the indigent.

In England this occurred officially with the passage of the Act of Elizabeth of 1601. The dissolution of the monasteries which

began in 1532[13, 14, 16] forced the government to consider the problem of indigent care, and the resulting inquiries led to the Act of Elizabeth which many readers call a perfect model of what a poor law should be. It dealt with three classes of persons as coming under the province of poor laws: the able-bodied who would not work, the infirm who could not work, and pauper children. The act specified relief for the infirm, employment of the able-bodied, and the maintenance and education of pauper children. For the first time we find official recognition that poverty, accompanied by need for public assistance, is in some instance brought about by disease and injuries. Elizabeth's Law was to be amended several times in the course of the subsequent centuries, but the recognition of this point remained fixed in English poor laws even though the laws varied in their emphasis from repression of paupers to broadening of the base for assistance. An appraisal of changes in public policy as it concerned indigent medical care and of the developments in medical care during the seventeenth and eighteenth centuries is provided by Rosen.[22, 23]

The Act of 1834[3, 17] went farthest in identifying an association between sickness and poverty. In the first place it ordered that outdoor medical relief (i.e., relief at home) should be given in case of sudden or dangerous illness. This provision immediately brings to mind the concept of medical indigency which has been given consideration in recent years in this country. In the second place, this act authorized the appointment of medical officers to care for the indigent. This provision was criticized later, as similar ones are criticized today in this country, because the medical care furnished was often inadequate. It was criticized, also, because it "calculated to deter people from making provision for the day of illness and exercises a directly demoralizing influence. Those who have once accepted this kind of relief often lose the sense of responsibility and independence, and do not emerge again from the ranks of pauperism. The fact that the receipt of medical assistance is often the first step to permanent pauperism frequently stands in the way of measures calculated to improve the quality of medical relief."[3]

Elizabeth's Poor Law and the Amendments which supplemented it influenced the pattern of state legislation on paupers in this country. Edith Abbott[1, 11] points out:

> The theory that the taxpayers of the community must provide the necessaries of life for those unable to provide such necessities for themselves came to this country with our seventeenth-century English ancestors. . . . As the first of the new states was organized west of the Allegheny Mountains this same theory was formally recorded in a territorial statute as early as 1790. In that year an eighteenth-century legislature, meeting in Marietta, Ohio wrote the same principle of public responsibility into the first poor law of the old Northwest Territory and authorized the county justices to appoint township overseers of the poor as public administrators of this new service. This early poor law followed English tradition and adopted the principle of local responsibility—requiring local authorities to report any person who, because of poverty, sickness, accident, or other misfortune, was, in the words of the old statute, "a miserable and proper object of public charity."

Although the states have varied in their approaches to the problems of indigency, we find always acceptance of the rôle of sickness in poverty. This is manifest not only in the legislation which in one way or another provided more medical care to the indigent, but primarily in the basic tenet which was restated from time to time, to wit: that sickness and its consequences are distinctive marks of the "deserving" poor. As late as 1882, we find among the stated purposes for founding the New York City Charity Organization: "(4) To obtain[34] from the proper charities and charitable individuals suitable and adequate relief for deserving cases."

Measurements of the Impact of Sickness on Poverty

Although the importance of sickness and its consequences in pauperism, i.e., the poverty for which the community assumes responsibility, had been indicated since late in the sixteenth century, we do not find until the middle of the nineteenth century any real attempt to measure the extent to which sickness is responsible for poverty.

In the report of 1834 of the Poor Law Commissioners,[7] of which Chadwick was secretary, the thesis is set forth that improvements in sanitation will have considerable effect on the well-being of the "labouring population," and case histories are cited to demonstrate excessive sickness among this population. Statistics are not presented except as in the following statement:

> That the various forms of epidemic, endemic, and other disease caused by, or propagated chiefly amongst the labouring classes by atmospheric impurities . . . by damp and filth, and close and overcrowded dwellings prevail amongst the population. . . . That of the 43,000 cases of widowhood, and 112,000 cases of destitute orphanage relieved from the poor's rates in Eng-

land and Wales alone, it appears that the greatest proportion of deaths of the heads of families occurred from the above specified and other removable causes. . . .

These data do not measure the amount of sickness among the paupers, let alone among persons in low economic condition not on public assistance.

The annual reports of the Poor Law Commissioners[18, 19] of the period are not much more useful. For example, the report for 1844 reveals only that nearly 9 per cent of the population of England and Wales was on relief (approximately 1,500,000 persons), and among these 16 per cent or 240,000 persons were in the workhouse. If the letter of the law of 1834 had been observed, it means that for at least 16 per cent of the paupers there was sickness in the individuals or death of the breadwinner, but in some cases able-bodied persons were in the workhouse. In addition, among 1,200,000 or more persons who received out-door relief mention is made of approximately 300,000 being partially or wholly disabled by age and illness.

Reports on the number of paupers and on the reasons for their status were at the time known to be incomplete. Eventually, even the English Parliament was dissatisfied with the information it received in the official reports, and in 1865 the House of Commons ordered special reports with particular reference to the number of sick persons and causes of destitution. From these special reports, that of 1870,[19] for example, we learn that approximately 13 per cent of persons on out-door relief were sick; furthermore, that old age or permanent disability was the cause of destitution in almost one-half of the persons. While these data tell us very little about the significance of disease and its economic consequences, they do provide a first measure of the amount of sickness among the beneficiaries of the poor law. Apparently they also served to stimulate the collection of more detailed data by private charity organizations.

It is of interest to note that although the Act of Elizabeth was primarily aimed at providing a mechanism which would supplant the "ineffectual" way with which private, and particularly religious charity, had dealt with the problem of relief of the poor, private charity continued to exist and apparently expanded at the same rate as public relief. For example, the first hospitals and dispensaries for the poor were built and operated by private charity.[23] By 1868[3] there were listed 1,059 charitable societies in London.

These societies had an income estimated at seven million pounds per year, about equal to the expenditures of the public agencies at the time.

The existence of numerous private agencies led to an effort at coordination. The Charity Organization Society was established in London in 1869 and spread to this country in Buffalo in 1877.[34] The purposes of the Charity Organization Society were threefold: (i) the organization of charitable relief, (ii) the repression of mendicity, and (iii) the improvement of the conditions of the poor.

The function of private charity, according to charity organization papers, "is to prevent, to remedy, and not merely to alleviate distress."[3] All applicants to the Charity Organization Society were investigated, for the most part by paid officers of the Society. Full details were obtained as to the cause of poverty in order to distinguish between charitable cases and poor law cases. When persons were eligible for private charity, the relief was to be "adequate in kind and amount having self-dependence and recovery from distress as its end." As a rule, charitable relief was given only when the Society decided that the applicant had such good qualities that the help in temporary distress would have a lasting effect. Chronic destitution and poverty due to gross misconduct were considered problems for public charity.

In line with their stated objectives the Societies of the Organization began to examine the facts at their disposal to "determine the underlying causes" of poverty. Among the first steps, at the National Conference of Charities and Corrections[32] in Buffalo in 1888, the Charity Organization Societies in the United States agreed upon a schedule of the causes of poverty to be used by all the societies in an effort to keep uniform statistics. It was also agreed at this conference that in preparing statistics only the chief cause of destitution was to be considered and not the secondary causes.

This action represented another step toward the identification and measurement of the health factors related to poverty. It was accompanied by the development of studies aimed at a quantitative description of the "causes" of poverty which have been continued to this day.

An early case study of this type was made in Buffalo[33] for the ten-year period 1878-1887. The cases or families studied were those which had been investigated by the Charity Organization Society. The study included 6,197 families, and the cause of poverty as

determined by the Society in each case was tabulated. The number of cases in each category and the per cent of the total cases are shown in the table.

From this table it appears that sickness, accident, insanity of the breadwinner, intemperance, and physical defects when combined were the causes of poverty in 44.4 per cent of the families. To this group some of the families with "no male support" should probably be added where widowhood was the primary reason for assistance. On the basis of these data it could be concluded that

Causes of Poverty in Buffalo—1877-1887

	Number	*Per cent*
Lack of employment	1,873	30.2
Sickness	1,268	20.5
Accident	208	3.4
Insanity of breadwinner	51	.8
Insufficient earnings	451	7.3
No male support	397	6.4
Imprisonment of breadwinner	108	1.7
Intemperance	700	11.3
Shiftlessness	440	7.1
Physical defects	525	8.4
No cause	176	2.9
Total number of cases	6,197	100.0

problems of health were directly responsible for the poverty of almost one-half of the families on the rolls of the Charity Organization Society of Buffalo.

This report is typical of the many which have since been published on the "causes" that bring about requests for welfare assistance from public and private agencies. A few of these reports pertaining to other communities will be cited, although the classification of causes and other conditions do not make them comparable.

Frankel[9] examined the causes of dependency of 100 families who had applied for the first time for assistance during the fiscal year 1905 to the United Hebrew Charities in New York City. He found that for 62 of the 100 families sickness was the immediate cause of distress, and in 14 others, widowhood. Among the 62 families in the first group, sickness was present in the wage-earner in 60 families. It is of interest to observe the disease conditions

responsible for the sickness of the wage-earner. The following table reflects the importance of tuberculosis in that period and already reveals the importance of chronic degenerative diseases as a factor in dependency in this particular sample of families.

In connection with the data of the table, Frankel stated: "The evidence seems to be conclusive, however, that the diseases from which these men suffered were produced, or at least aggravated by overwork in three instances, poor nourishment in fourteen instances, bad industrial environment in seven cases, overwork and

Disease conditions in sickness of wage-earner	*Number of persons*
Tuberculosis	18
Rheumatism (incapacitated for work)	8
Chronic heart disease	2
Asthma	2
Cancer	2
Intestinal catarrh	3
General debility	3
Ruptured	2
Victims of operation (1 because of accident at work)	3
Lead poisoning	2
Insane	2
Other (disease of abdominal tract, etc.)	4
Total	60

bad industrial surroundings in four instances, overwork and poor nourishment in three cases and bad industrial surroundings and poor environment in two instances."

A similar survey,[10] although concerned only with immigrants in 43 large cities, was made by the U. S. Immigration Service during the period from 1 December 1908 to 31 May 1909. The purpose was to determine the status of immigrants as charity seekers, and the pertinent data were obtained from the social agencies of the cities surveyed. Altogether, information was collected on a total of 31,685 families. Among these families, the immediate causes of distress were: death or disability of the breadwinner in 29 per cent of the families, death or disability of another member of the family in 19 per cent of the families; thus 48 per cent of these immigrant families required assistance as a consequence of a health problem. In addition, old age of the breadwinner was considered a cause of seeking aid in 6 per cent of the families, so that

a total of approximately 54 per cent of these families required assistance for reasons of health and physical and mental incapacity.

In 1916–1917 the Alliance of Charitable and Social Agencies of Baltimore[21] tabulated the immediate apparent causes which brought 8,663 families under the care of the organizations in the Alliance. Throughout this study the diagnosis made by the charity worker in charge of the case was accepted as the basis of the tabulation. Physical illness (including accidents and mental trouble) is given as the cause in 4,072 instances or 47 per cent of the total number. Of the 4,072, 1,470 were classified as temporary illness, 138 as illness of pregnancy or childbirth, 170 as needing attention to eyes or teeth—a total of 1,778 temporary cases or about 20 per cent of the total cases studied. Tuberculosis was reported as accounting for 708 cases and other chronic illness or mental trouble for 1,478, making a total of 2,186, more than one-half of those incapacitated by disease and 25 per cent of the total number of cases. If the 4,072 cases recorded as arising from physical causes are added to the 2,236 ascribed to mental or moral weakness, the total becomes 6,308 or nearly three-quarters of the total cases studied.

In tabulating the reasons for the applications to the various societies the Committee that prepared the report stated:

> It is not our belief that the real underlying reason for application to charitable or social organizations can be definitely ascertained or coded. We recognize fully the fact that in many cases the reason is not single, but a complex made up of a large number of causes . . . that the Society interested can only determine the reason after long study, or in some cases, remain permanently in doubt. Eliminating these special cases, however, it seems to the Committee worth while to tabulate the immediate apparent cause which placed the family or individual seeking relief in its position of economic dependence.

This comment is well worth bearing in mind.

Another study which follows the same pattern is that undertaken in 1929 in Boston[28] by three relief agencies to determine the factors associated with dependency. From the lists of families receiving assistance, one thousand were selected for special study with reference to the reasons that led to the request for assistance.

It was found that "physical incapacity" was the reason for dependency in 41 per cent of the families, while "old age" was the reason in 5 per cent. Included in the term physical incapacity were chronic sickness, found in nearly half of the families of the group so classified, and temporary sickness noted in nearly one-fourth.

More recently the Bureau of Public Assistance of the Department of Health, Education and Welfare[31] summarized the reports from 20 states on the reasons for opening cases under the General Assistance program for the fiscal year ending 30 June 1953. As usual, sickness was a frequent reason for requesting community assistance. Illness or disability in one or more members of the family was the reason for opening 26.7 per cent of the cases, while death or absence of the wage-earner was the reason in 7.2 per cent additional cases.

Taken at face value, these findings and the preceding ones indicate that sickness or its consequences was and is a major problem in a substantial proportion of the families—from one-fourth to two-thirds—who receive community assistance.

It is, however, difficult to interpret these statistics and to draw from them sound inferences regarding the relationship of disease conditions to poverty. In the first place, the frequency with which individuals with health problems are given community help is to some extent dependent upon the nature of the community program. If, for example, the assistance program is directed mainly at medical care services, or is limited by definition to indigents whose lack of financial resources is due to physical incapacity, it is to be expected that all the individuals receiving assistance will have physical incapacity, just as we would expect that all or most admissions to a hospital would have some illness. In the second place, although it may be possible to indicate that sickness was the antecedent or "cause" that led to the request for assistance, statistics such as these fail to reveal the characteristics of the disease conditions which bring about this request and whether or not diseases among persons on assistance programs differ in kind or numbers from those which occur in the remainder of the population.

With reference to this second point, more specific information is available when data are obtained on the health status of persons who receive assistance. Thus, the Tennessee Department of Public Welfare[30] surveyed the recorded health problems of the recipients of Public Assistance and Child Welfare services on the registers in September, 1940. During that month there were 136,415 persons who were recipients of those forms of assistance. Of these persons, 54,047 or 39.6 per cent were disabled. The table below gives the percentage of persons with the more frequent types of disability

among these disabled recipients. These statistics point out the numerical importance of the chronic degenerative diseases in the disability pattern of the persons receiving public assistance.

Statistics of this type, however, do not reveal how or why arthritis, for example, found so frequently in these persons has a bearing on the fact that they are on public assistance. Without such knowledge no effective progress can be made in understanding the relationship of disease to poverty.

Tennessee Department of Public Welfare
Type of Disability and Per Cent of Total Disabilities

Type of disability	*Per cent of total*
Arthritis	17
Senility	11
High blood pressure	8
Heart	7
Kidney	7
Tuberculosis	5
Crippled	5
Other	40
Total	100

As we have said, one of the major limitations of the types of statistics cited is that they deal with the selected group of persons whose status satisfies the requirement of the particular community agency involved. As a consequence the number and characteristics of the poor will vary with the eligibility requirements of the moment and place and so will the proportion of the sick and disabled among the poor. In brief, these data cannot be used to measure the extent and the means whereby sickness and poverty are related.

A step further toward the measurement of this relation is offered by the social surveys. Outstanding examples of these surveys are those by Booth[4] undertaken in 1886 on the working population of London and repeated by H. L. Smith[29] in 1929; by Rowntree in York in 1899,[24] 1936,[25] and 1950;[26] and by Bowley and Burnett-Hurst[5] in 1913 in the English towns of Northampton, Warrington, Stanley, and Reading. The Bowley-Burnett-Hurst surveys may be of particular interest to statisticians since these investigators introduced a sampling scheme in their survey.

The pattern of these surveys differs from the reports cited above since they were concerned not merely with families or individual recipients of community assistance. In these surveys the families of the community were classified in terms of income level according to a predetermined standard. Then an attempt was made to identify the "cause" of poverty for those whose income status fell into the category defined as poor.

Booth's findings indicated that more than 8 per cent of the East London population was living in great poverty and an additional 22 per cent in poverty. With respect to the causes Booth reported that in 10 per cent of the families living in poverty or great poverty, illness or infirmity was a "cause" of the low income status. In another 7 per cent of the families, illness associated with large families and irregular work was the "cause" of the low economic conditions. Smith's re-survey of 40 years later found 10 per cent of the population in poverty; found that illness or incapacitation alone was an apparent cause of poverty in 6 per cent of the families living in poverty, and illness together with old age and death of the father constituted the cause for 53 per cent of the families. In sum, Booth estimated that about 31 per cent of the families of London lived in poverty, while Smith estimated only 10 per cent, a reduction of two-thirds. At the same time, illness or its consequences was apparently related to the poverty in 17 per cent of the poor families in 1889 and in 53 per cent in 1929; a threefold increase in 40 years. If these figures could be accepted at face value, they would indicate that in London the proportion of *all* the families in which there was poverty with illness (or its consequences) remained constant at approximately 5 per cent during the span of 40 years. This is remarkable if true. In any event, these observations revealed the important fact that while the economic level of the population of London has been raised during the 40-year interval and the factors related to income and employment had assumed numerically less importance in relation to poverty, the factors of health had assumed relatively greater importance.

Bearing on this point are the surveys of 1899,[24] 1936,[25] and 1950[26]conducted in York by B. S. Rowntree. These surveys were limited to the working-class population of that city. In 1899, 15 per cent of the population in the working-class areas of the city and 10 per cent of the total population were living in primary poverty, i.e., with earnings insufficient "to obtain the minimum necessaries for the maintenance of merely physical efficiency." In 1936 only

7 per cent of the working population and 4 per cent of the total population were found to be at this economic level.

When the frequency of the immediate "cause" of poverty was examined in the two periods the results shown in the accompanying table were obtained. We see, as we examine this table, that the pattern of causes altered between 1899 and 1936. Low wages were the most important cause numerically in 1899, unemployment, in 1936. Death of the chief wage-earner was far less important in 1936 than in 1899 as we would expect in view of the decline in mortal-

	Percentage of persons living under primary poverty line			
	Among persons under primary poverty line		*Among total population*	
Immediate cause of poverty	*1899*	*1936*	*1899*	*1936*
Death of chief wage-earner	15.63	8.97	1.54	.34
Illness of chief wage-earner	5.11	5.58	.51	.22
Old age of chief wage-earner		17.92		.70
Unemployment	2.31	44.53	.22	1.74
Irregularity of work	2.83	5.87	.28	.23
Largeness of family, i.e., more than four children	22.16	7.97	2.20	.31
In regular work but at low wages	51.96	9.16	5.15	.36
Total	100.00	100.00	9.90	3.90

ity. The change of particular interest is the proportion of persons for whom the causes of poverty were illness and old age of the chief wage-earner. Altogether these two categories of causes involved only 5 per cent of the group in 1899 but involved 23 per cent in 1936. In terms of the total population, in 1936, 0.92 per cent were living under the primary poverty line because of illness or old age of chief wage-earner as compared with 0.51 in 1899.

Exact comparisons between 1899 and 1950 cannot be made because the data are lacking. However, a comparison between 1936 and 1950 is presented below.

These data refer to all families living in poverty (not only primary poverty)—5 per cent of the working class families in 1950, 31 per cent in 1936. These percentages reveal immediately that between 1936 and 1950 the conditions had improved considerably. The data of the table show that poverty "caused" by unemployment and low wages had been eliminated; and that while that due

to old age, sickness, and death of the chief wage-earner had been reduced, these conditions were in 1950 by far the most frequent "causes" of poverty. Again, it would seem from these data that in terms of the total population, the amount of poverty together with sickness remained fairly constant in nearly 60 years.

The studies mentioned, Booth's and Smith's on the London population, Rowntree's on the York population, as well as those of Bowley and Burnet-Hurst, represent a considerable advance

Cause of poverty	*Percentage of working families in poverty**			
	Among families living in poverty		*Among all families*	
	1936	*1950*	*1936*	*1950*
Death of chief wage-earner	9.2	6.4	2.8	.3
Sickness	4.0	21.3	1.2	1.0
Old age	23.6	68.1	7.3	3.2
Unemployment of chief wage-earner	24.7		7.7	
Inadequate earnings of other workers	9.2		2.8	
Miscellaneous	3.0	3.2	1.0	.2
Inadequate wages of earners in regular employment	26.3	1.0	8.2	

* Excluding persons in institutions, domestic servants, and remainder of population.

from the investigations based on persons on public assistance. Whether or not we would agree with the definitions of poverty that were employed, the studies based on the classification of the population of the community are not affected by the artifacts dependent upon varied interpretations and administration of public assistance laws and upon changes in public assistance programs from time to time and place to place. In common with investigations based on public assistance groups, the studies cited above may be open to question regarding determination of the causal relationship between sickness and poverty. Nevertheless, from both types of investigations with monotonous regularity we find that sickness and its consequences constitute a significant element in poverty. If we can generalize from Booth's and Smith's and from Rowntree's investigations, the rôle of sickness is becoming of relatively greater importance in England as social legislation and changes in economic conditions reduce the effects of unemployment and other factors that bear directly on the income of the individual and family.

We repeat, all of these studies provide only a crude index of the amount of disease and of its consequences among the lower income groups. The data reported do not, and in the manner in which they have been collected cannot, reveal other than that among families in the lower income groups and families on public assistance there are many problems related to sickness and old age. How these conditions have a bearing on income or public assistance status cannot be determined from the observations reported.

SUMMARY AND DISCUSSION

This review of the historical development of data on disease as a cause of poverty has brought out the following points of interest:

1. For centuries it has been recognized that poverty is often accompanied by illness or its consequences.

2. So long as the relief of poverty rested on the church and voluntary charity, the relationship between illness and poverty was accepted, in insurance parlance, as an act of God.

3. When the community assumed responsibility for the poor some four hundred years ago in England, illness and its consequences served to distinguish the "worthy" from the "unworthy" poor.

4. Only in the last hundred years have we obtained some measure of the frequency of disease and of its consequences among the groups of the population that have low income or are a charge to the community.

5. A substantial amount of illness and disability have been reported among persons with low income and on public assistance. Sickness or its consequences have been considered the "cause" of poverty in as many as one-fourth to two-thirds of the families in such low economic status.

6. Where legislation and other community actions have been highly developed to eliminate or mitigate the effects of unemployment, low wages, and factors bearing directly on economic status, as is the case in England with its health insurance and welfare programs, disease and its effects are becoming numerically more important as a "cause" of poverty.

The most impressive finding of this review is the lack of facts which reveal *how* and *when* illness brings about poverty or the need for public assistance. Such data as have been reported do not and in some respects cannot give this information. In the first place, poverty as defined by the number of persons on public as-

sistance varies in relation to regulations and laws regarding public assistance and to the economic conditions of the community. In the second place, illness itself may be a criterion for admission to public assistance. While the social surveys mentioned avoid this type of bias, they have been limited to a consideration of families with low income. In common with the studies based on data of social agencies, the findings of these surveys are inadequate to provide an interpretation of the occurrence of sickness among the poor, because they do not reveal how much this sickness differs in amount and kind from that which occurs in higher income groups. Furthermore, they do not indicate under what conditions and in what manner disease or its consequences "cause" poverty. As of now, these data and inferences drawn from them resemble too much a *post hoc, proper hoc* type of argument: Poor people have sickness, therefore sickness is the cause of poverty.

It is understandable why such meager evidence has not been productive of effective measures or even sustained efforts to bring about further reduction in poverty through control of disease. At the time that Chadwick, T. Southwood Smith, and others took the stand that poverty could be reduced by removing the cause of disease, they argued that filth and insanitary conditions have a direct bearing on the highly fatal and frequently recurring infectious diseases and that the poor lived in filthy and insanitary conditions. They presented no extensive data to prove their point, but the conditions they described were so striking and so obvious that the community was willing to accept them as the basis of the relationship between sickness and poverty and therefore to support the public health movement. With the improvement in personal and community hygiene, the current basis of the relationship between sickness and poverty is not so obvious or striking; and although others have continued to restate the views of Chadwick or his contemporaries, the restatements have not produced a reaction of the same intensity.

For example, the report of the English Poor Law Commission of 1909[6, 20] stated: "Sickness is . . . admittedly one of the chief causes of Pauperism (dependency), and the more chronic its character and the longer its duration, the greater the likelihood of its producing dependence. . . . We estimate that at least one-half of the total cost of pauperism is swallowed up in direct dealing with sickness. . . . It is probably little, if any exaggeration to say that, to the extent to which we can eliminate or diminish sickness among

the poor, we shall eliminate or diminish one-half of the existing amount of pauperism (dependency)." And E. T. Devine[8] at about the same time wrote that charity must "deal not only with individuals who suffer, but with social conditions which tend to perpetuate crime, pauperism and degeneracy—that disease must be understood and overcome, that hospitals, dispensaries, surgical and medical treatment, nursing and preventive measures must be developed and dovetailed into a general social scheme for the elimination of preventable diseases and a very substantial reduction in the prevalence of such diseases as cannot yet be classed as preventable."

Even though no preventable health program against poverty has been stimulated, yet by statements such as these, they may eventually bear fruit. We can recall that in 1909 Frederic Almy[2] pointed out: "An artificial leg, or education for a suitable employment, may cost a large sum and yet be cheaper in the end than continuous support." And finally in 1920 the first federal funds were available for medical services in this program. Moreover, during the last decade we have witnessed the organization of community programs aimed at the restoration of persons handicapped by physical, mental, emotional, or social disability. An outstanding example of such a program for persons on public assistance is that of the City of Chicago Department of Public Welfare recently described by Muller.[15]

The slowness with which communities approach rehabilitation and the total absence of preventive programs based on the assumed effects of sickness on income status are due, we are convinced, to the lack of basic facts about the influence of diseases on economic status. This lack hampers not only the formulation of a rational program of prevention but also the stimulation of interest on the part of the community in such a program.

The basic facts needed are:

1. The frequency of disease in different socio-economic groups. There are data (which will be discussed in another paper) mostly on differences in prevalence, a few on incidence.

2. The impact of disease on different socio-economic groups. Data on this point are almost entirely lacking. What we need to know is how a certain condition, let us say cancer, actually brings about a decline in economic status. It is not only a matter of determining how much the expenses reduce the financial resources of a family, but also how permanent is this reduction, how it is related to the pre-illness income level of the family, and how and when it forces the family to require assistance from the community. Lawrence's[12] investigation based on Hagerstown families surveyed in 1921-24 and 1943 and followed thereafter in relation to the indigent med-

ical care program of Washington Co., Maryland provides first data on this question. He reports that among families that were in well-to-do circumstances in 1923, none had members who became medical-care recipients during the period 1945-50. At the other end of the economic scale, among the very poor of 1923, 15 per cent had members receiving medical care from the state in later years. He observes further that the families poor and very poor in 1923 who had *not* become recipients of indigent medical services were singularly free from chronic disease.

From these limited observations it should be clear that the problem of the interrelationship of disease and poverty must be considered in terms of both of the two major variables involved—the pre-disease economic status of the individual and family and the nature of the disease itself. When the disease strikes both the wealthy and the poor, it is anticipated that its effects in terms of lowering economic status will be different. But this difference will depend also on the nature of the disease and what it involves in disability and in the kind and amount of health services required.

The continuous and ever-increasing activities to determine the etiology of chronic and disabling conditions will undoubtedly produce knowledge on which to base programs of prevention. In the meantime, the further development of medical and allied social insurance schemes will help to provide some means of alleviating the effects of disease. But such schemes still depend on the contribution of the community, albeit indirect, to assist that portion of the population at the lower end of the economic scale. Until and when the time arrives that we have effective programs of chronic-disease prevention, a rational approach to the alleviations of the effects of disease requires discarding the attitude of passive acceptance of the relationship of disease to poverty and replacing it with more vigorous and intensive efforts toward a careful examination of the real nature of this relationship.

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The Sarah Stout Murder Case: An Early Example of the Doctor as an Expert Witness

ALBERT ROSENBERG*

"HER face and her neck to her shoulders appeared black and so much corrupted that we were unwilling to proceed any further; but her mother would have it done, and so we did open her up."[1] The jury listened attentively to Dr. Coatsworth's testimony concerning the autopsy performed on the corpse of Sarah Stout six weeks after its burial. The Hertford Assizes were in session; it was 18 July 1699; Spencer Cowper and three alleged accomplices, John Mason, Ellis Stevens, and William Rogers, were on trial for the murder of Sarah Stout.

Spencer Cowper, the main defendant, was a young, successful lawyer, whose father and older brother were prominent Whig politicians. All four defendants were members of the legal profession traveling with the home circuit of the Assizes, which had arrived in Hertford that year on Monday, 13 March.

In Hertford Sarah Stout and her mother were living in very comfortable circumstances because of the industry and thrift of the late Mr. Stout, a maltster. Indeed Sarah, attired in a close white cape and poke bonnet, received considerable attention as the local heiress. Since the Stouts had supported the Cowpers in local elections and were good friends of the family, it was natural that Spencer should call there when he arrived in Hertford. It was also generally known that he had invested some money in mortgages for Sarah, and he declared that he called that evening to deliver to her a payment of interest on her money.

As is usual in trials of murder, the accounts of what happened varied. The main outlines of the case, however, were clear. At about eleven o'clock in the evening Cowper and Sarah Stout were alone together in the sitting room of her house. The maid had gone up to warm his bed, understanding that he was to spend the night there. The sound of a door closing was heard; and when the

* University of California, Davis, California.

1 *The trial of Spencer Cowper, Esq; John Marson, Ellis Stevens, and William Rogers, Gent. for the murder of Mrs. Sarah Stout, a Quaker. Before Mr. Baron Hatsell, at Hertford Assizes, July 18, 1699.* London, 1741, p. 48.

maid and Sarah's mother, anxious because no further sounds of activity were heard, came into the sitting room, no one was there. They waited up all night; their vigil was in vain. Early in the morning a neighbor brought the sad news. Sarah Stout had been found drowned in the pond by the mill dam.

The coroner's inquest was routine. In absence of any evidence of foul play and of any motive, the decision was that she took her life while *non compos mentis.*

Six weeks later Dr. Coatsworth, a surgeon, was summoned by Dr. Phillips to be present at the opening of the body of Sarah Stout. He was told that there was suspicion of murder. While in Hertford he lodged with the mother of the dead girl, who told him she would not rest until she knew whether her daughter had been with child or not. As he declared in court, he informed her that "we should find the parts contained in the abdomen so rotten, that it would be impossible to discover the uterus from the other parts."[2] Dr. Coatsworth then explained patiently that it would only be possible to tell if the embryo had already become bony. Still the dead girl's mother insisted on the autopsy.

The Stouts were Quakers, and the Quakers were the target of seemingly endless scurrilous abuse. Grub Street writers like Tom Brown and Ned Ward used the name Quaker as a synonym for hypocrite. And now rumors were circulating that Sarah Stout had not been as good as she might have been and that she took her life to avoid the shame of being pregnant and unwed. The entire Quaker community demanded that action should be taken to clear the name of Sarah Stout.

Dr. Coatsworth continued his testimony:

> And as soon as she was opened, we perceived the stomach and guts were full of wind, as if they had been blown with a pair of bellows; we put her guts aside, and came to the uterus, and Dr. Phillips shewed it us in his hand, and afterwards cut it out, and laid it on the table, and opened it, and we saw into the cavity of it, and if there had been anything there as minute as a hair, we might have seen it, but it was perfectly free and empty.[3]

Satisfied that the Quaker girl had not been pregnant at the time of her death, the doctors and surgeons continued examining the body. They found that the stomach, lungs, and diaphragm were sunk flat and contained no water; and they were not putrefied. The surgeons and doctors present, with the exception of Mr.

[2] *Ibid.*
[3] *Ibid.*

Camlin, Spencer Cowper's surgeon, concluded and signed an affidavit to the effect that Sarah Stout could not have been drowned, since if she had taken in water, the water must have "rotted all the guts."[4]

Armed with this affidavit, they were able to bring a charge of murder against Spencer Cowper and his three colleagues. Mr. Jones prosecuted the case as Counsel for the King, while Cowper conducted his own defence. It was, as the King's Counsel stressed, really two trials: to clear Sarah Stout's name from the obloquy of suicide and to punish her murderers.

The prosecution's star witness was Sarah Walker, the Stouts' maid. She insisted that Spencer Cowper intended to spend the night at the Stouts' home, that she warmed his bed for him, and that she heard a door slam shut about eleven o'clock at night. This evidence placed Cowper in a very awkward situation; he was shown to be acting in a very suspicious manner and to have been the last person known to have been with Sarah Stout while she was still alive.

Next the prosecution called a series of witnesses, the people who removed her body from the pond, to establish that she was floating very near the top of the water. She was, according to their testimony, on her right side, with her right arm driven between two stakes (used to keep weeds from drifting into the mill) just below the surface of the water, which was about six feet deep. This testimony was intended to establish the fact that she was floating in the water and that nothing hindered her from sinking.

Mr. Jones then called to the stand the women who stripped the body of Sarah Stout. Elizabeth Hustler, Sarah Kimpson, and Anne Pilkington, who removed her stays and prepared her body for burial, agreed that the nude body revealed no swelling. They also declared that there were some bruises on the body, but no mark around her neck. This testimony was corroborated by John Dimsdale Jr., a surgeon, who was the first expert to examine her.

When Sarah Peppercorn, the next witness, appeared a wave of laughter spread through the court. Sarah was the local midwife; she had obviously been called to testify because of the malicious

[4] *Ibid.*, p. 49. The affidavit read: "We, whose Names are here under-written, having examined the Body of Mrs. *Sarah Stout* deceased, do find the Uterus perfectly free and empty, and of the natural Figure and Magnitude as usually in Virgins; we found no Water in the Stomach, Intestines, Abdomen, Lungs or Cavity of the Thorax." A true copy of the affidavit was published in *Some observations on the tryal of Spencer Cowper, J. Marson, E. Stevens, W. Rogers, that were tried at Hereford, about the murder of Sarah Stout, together with other things relating hereunto.* London, 1701, p. 13.

rumors of Sarah Stout's pregnancy. She declared she found no evidence of pregnancy and no swelling of the body.

The prosecution then presented the evidence of the group of surgeons who had examined the body of Sarah Stout at the autopsy. They agreed with Dr. Coatsworth's contention that the absence of any quantity of water in the internal organs indicated that Sarah Stout had not been drowned, but had been dead before her body entered the water. They also agreed with Dr. Coatsworth that a body is drowned when it is suffocated by water passing down the windpipe into the lungs upon inspiration; and at the same time, the water pressing down upon the gullet, a great part of it is swallowed into the stomach.

The next witness, Edward Clement, a sailor, related some of his experiences at sea during bloody battles; he had seen many drownings and dozens of dead bodies flung into the sea. When he began narrating some difficult-to-believe tales of sea life, Mr. Jones interrupted him: "Then you take it for a certain rule, that those that are drowned sink, but those that are thrown overboard do not." The loquacious sailor gave what he considered both a witty and authoritative reply: "Yes, otherwise why should the government be at the vast charge to allow threescore or fourscore weight of iron to sink every man, but only that their swimming about should not be a discouragement to others."[5]

The evidence linking and implicating John Marson, Ellis Stevens, and William Rogers with Spencer Cowper rounded out the prosecution's case. The three lawyers had come to Hertford together and lodged together at the house of the Gurrey family. They were reported to have come in at eleven o'clock at night and to have engaged in some very suspicious conversation. One said to Marson: "She was an old sweet-heart of yours." "Ay," says he, "But she cast me off, but I reckon by this time a friend of mine has done her business." Another bit of discourse overheard was: "I believe a friend of mine is even with her at this time." Still more damaging was the remark attributed to one of the group: "Sarah Stout's courting days are over." Furthermore, there was some talk about money which seemed incriminating. "What money have you spent today," said one man. "Thou has had forty or fifty pounds for thy share." The reply was: "I will spend all the money I have for joy the business is done."[6] These three men were linked with Cowper,

[5] *The trial of Spencer Cowper*, p. 69.
[6] *Ibid.*, pp. 82-6.

for they all admitted that they met the next day, held several conferences, and left town together. The prosecution closed its case by presenting evidence that Cowper left Hertford early on the morning that the body of Sarah Stout was found. Furthermore, he left without calling to express his sympathy, despite the fact that he was a close friend of the family.

The evidence against Cowper and his fellow defendants was all circumstantial, but it was strong. As a lawyer he knew that many men, guilty or innocent, had gone to the gallows on circumstantial evidence. Cowper had to break down the case against him; to fail meant death.

In his opening speech Cowper complained that two factions sought to prosecute the case: the Quakers, especially their eminent Mr. Mead who thought the reputation of the sect was on trial, and the Tory opponents of the Whig Cowpers, who hoped to break the political stronghold the family had in Herefordshire. He was transported by his deep feelings on the subject and the Judge was forced to interrupt his flowery rhetoric, warning him: "Do not flourish too much, Mr. Cowper."[7]

Cowper's first objective was to establish that Sarah Stout's body was mostly under water when it was found, but he only succeeded in weakening slightly the evidence presented by the prosecution on this vital point. At this point the gallows were still a very disconcerting probability.

Then Cowper called to give testimony some of the most eminent physicians in England, who had come down from London especially for this case. The prosecution's medical witnesses were virtually unknown outside their home counties, but Cowper's physicians and surgeons were men famous throughout the kingdom. Dr. Hans Sloane, the first to testify, was noted both as a brilliant physician and a great collector of curiosities of natural history. As physician to Christ's Hospital and Secretary of the Royal Society, he was able to command respect as an expert witness in medical matters. He declared in an authoritative tone that the quantity of liquid taken in was of little importance in cases of drowning. It is the fact that some enters the windpipe that causes death in drowning cases, Sloane maintained. As proof of this statement, he told of people suffocating on a few spoons of medicine when they were too weak and were forced to take the medicine. In concluding his testimony Sloane struck another blow at the prose-

[7] *Ibid.*, p. 108.

cution's case by asserting that water in the stomach would not cause putrefaction.

Samuel Garth, noted as a poet and wit as well as a physician, was now called upon to give evidence. Asked for his opinion of the testimony presented by the surgeons who were witnesses for the King, he answered in a methodical manner:

> I observed in this Trial the first Gentleman called for the King, that spoke to this Matter, was Mr. *Coatworth;* he saith, he was sent for to open her, upon an Aspersion of her being said to be with Child. I agree with him in what he speaks as to that Point, but must differ with him where he infers she was murdered, because he found no great Quantity of Water in her, as also her Head extremely mortified, but not her Lungs.[8]

Garth then presented his reasons, based on his experience as a physician, for differing with the surgeon Coatsworth:

> Now, my Lord, as to the Matter of Putrifaction, I think 'tis not much material whether there be any Water or no in the Cavities of the Body; if Water would hasten Putrifaction, it would do it as well in the Lungs as otherwise; there is always some Water in the *Lymphaducts* there, the breaking of which may be one Occasion of Catarrhs. As to what relates to the Putrifaction of the Head, it may happen from a Stoppage of the refluent Blood, which is staid there in a great Quantity, thro' the Suffocation of the Water, or from the Neatness of the Brain, which is observed often to mortify first.[9]

Next Garth considered the evidence concerning Sarah Stout's body being found floating in the water. He contended that it was impossible that the body should have floated, except if it were entangled among the stakes. All dead bodies not containing some extraordinary tumor, he believed, would sink in water. He reasoned:

> The Witnesses all agree she was found upon her Side, which, to suppose her to float in this Posture, is as hard to be conceived, as to imagine a Shilling should fall down and rest upon its Edge, rather than it Broad Side; or that a Deal Board should rather float Edge ways than otherwise; therefore 'tis plain she was entangled, or else the Posture had been otherwise.[10]

Garth continued, this time considering the evidence that very little water was found in Sarah Stout's internal organs:

> As to the Quantity of Water, I do not think it necessary it should be very great. I must own the Water will force itself into all Cavities where there is no Resistance. I believe, when she threw her self in, she might not struggle to save herself, and by Consequence not sup up much Water. Now there is not direct Passage into the Stomach but by the Gullet, which is

[8] *Ibid.*, p. 124.
[9] *Ibid.*, p. 125.
[10] *Ibid.*

contracted, or pursed up by a Muscle in Nature of a *Sphincter;* for if this Passage were always open, like that of the Wind Pipe, the Weight of the Air would force itself into the Stomach, and we should be sensible of the greatest Inconveniences. I doubt not, but that some Water fell into her Lungs, because the Weight of it would force itself down, but if we consider the Wind Pipe with its Ramification, as one Cylinder, the Calculation of its Contents will not amount to above 23 or 24 solid Inches of Water, which is not a Pint, and which might imperceptibly work or fall out.[11]

There was a burst of laughter at Garth's mentioning a wager made at Garaway's coffee house on the liquid capacity of the windpipe. Then the Judge, Baron Hatsell, questioned Garth concerning the sailor's testimony and also Dr. Sloane's statement that water would not putrefy a body. First Garth declared he believed as his eminent colleague did, noting that in some places meat was preserved from corrupting by keeping it in water. Then he took exception to the sailor's testimony, asserting with disdain,

The Seamen are a superstitious People, they fancy that a whistling at Sea will occasion a Tempest; I must confess, I never saw any Body thrown overboard, but I have tried some Experiments on other dead Animals, and they will certainly sink; . . .[12]

Garth now referred to the experiments he and his colleagues had just completed which convinced them that dead bodies will sink in water. He then gave another reason for suspecting the sailor's evidence:

. . . he saith, that threescore Pounds of Iron is allowed to sink the dead Bodies, whereas six or seven Pounds will do as well. I cannot think the Commissioners of the Navy guilty of so ill Husbandry, but the Design of tying Weights to their dead Bodies, is to prevent their floating at all, which otherwise would happen in some few Days; . . .[13]

At this point Garth indicated that he thought the case against the defendants was very weak because no evidence had been presented that Sarah Stout had been strangled or had received a mortal wound. He ended his testimony by answering the question whether any quantity of water can enter into the cavity of the thorax:

'Tis impossible there should, till the Lungs be quite rotten, there is no Way but by the Lungs, which are invested with so strong a Membrane, that we cannot force Breath with out Blow Pipes through it, and there's a great Providence in such a Texture, for if there were any large Pores in this Membrane, the Air would pass through it into the Cavity of the Thorax, and prevent the Dilation of the Lungs, and by Consequence there would be an End of breathing.[14]

[11] *Ibid.*, p. 126.
[12] *Ibid.*, pp. 127-8.
[13] *Ibid.*, p. 128.
[14] *Ibid.*, pp. 128-9.

The testimony of Garth and Sloane was backed up by the evidence given by their eminent colleagues, including the pedantic Dr. Crell, who would not heed the Judge's objections and insisted on presenting the opinions of several ancient authorities on the subject of drowning.

Then the eminent surgeon, William Cowper, considered by many the outstanding anatomist of his age, was called to give evidence.[15] Cowper related experiments he had performed to determine whether a dead body would float in the water. First a spaniel with an abundance of long hair was used, but his hair prevented his sinking. Then a dog with short hair was employed, and the body sank immediately. Cowper then conducted an experiment to establish what quantity of water entering the body is required to cause suffocation. Three live dogs were plunged under water. Less than three ounces of water was found in their lungs and one in their stomach.

From his experiments, Cowper concluded that "Dead Bodies necessarily sink in water, if no Distention of their Parts buoy them up; . . ."[16] He also concluded that the "Contents of a dead body are discharged by the Mouth and Nostrils, so soon as it begins to ferment."[17] Therefore, little fluid would remain in a body after six weeks in a grave. Cowper ended his testimony by expressing his opinion that it was utterly ridiculous to expect water in the cavity of the thorax, unless some damage had been done to the lungs to permit passage of water into the thorax.

The prosecution's case was significantly weakened by the expert medical testimony marshalled by Spencer Cowper. However, it still remained for Cowper to show that some motive for the suicide of Sarah Stout existed. Even if the circumstantial evidence in the case was not strong enough to result in a conviction, it might be damaging enough to ruin his career. He had to prove that Sarah Stout's death was suicide and not murder.

When the medical aspects of the case were ended, several confidantes of the Quaker miss testified that she was often melancholy and that the cause of her disorder was unrequited love. One wit-

15 William Cowper (1666-1709) was not related to the defendant. At the time of the trial, although only 33 years old, he was a Fellow of the Royal Society and the author of two important anatomical works: *Myotomia reformata; or, a new administration of the muscles of the humane bodies, . . .* (London, 1694), and *The anatomy of the humane bodies, with figures drawn after life by some of the best masters in Europe, . . .* (Oxford, 1698).

16 *The trial of Spencer Cowper*, p. 137.

17 *Ibid.*, p. 138.

ness declared that Sarah Stout admitted being in love, but sadly insisted she would not change her religion for a husband. Another witness had extracted from her the admission that she was in love with a person she could not marry.

Now came the sensation of the defence's case. Two letters purported to be from Sarah Stout to Cowper were introduced as evidence. In presenting these letters, Cowper declared that it was done only to save the three men accused with him; if he alone were on trial, he would not introduce evidence which would show the weakness of a gentlewoman. These letters were sent to false names, but it was clearly established by comparison with known letters of Sarah Stout's that they were written by her. The first ended with a lover's plea:

> When you come to H——D pray let your steed guide you, and don't do as you did the last time; and be sure order your Affairs to be here as soon as you can, which cannot be sooner than you will heartily welcome to—— your very sincere friend.[18]

The second letter was considerably more damaging to the reputation of the Quaker miss; for it indicated that she sought to live with him as a wife, though he was legally married to another woman:

> I writ you by Sunday's Post, which I hope you have receiv'd; however, as a Confirmation, I will assure you I know of no inconveniency that can attend your cohabiting with me, unless the Grand Jury should thereupon find a Bill against us, but I won't fly for't, for come life, come death, I am resolv'd never to desert you. . . .[19]

Members of Sarah Stout's family denied vehemently that she had written these letters. Her brother, when questioned if he believed the letters to be in her handwritings, declared, "I don't believe it, because it don't suit her character."[20] But the jury and many of the spectators at the trial had formed a new concept of the character of the dead girl.

Cowper then skillfully examined Mr. Barefoot, who took in lodgers, to establish that he had arranged to spend the night at his house and that he did definitely spend the night there. Following this, Cowper explained away the damaging testimony given by Sarah Walker by insisting that he allowed her to believe he was going to spend the night at the Stouts' home, so that he could

[18] *Ibid.*, p. 165.
[19] *Ibid.*, p. 166.
[20] *Ibid.*, p. 171.

talk privately with Sarah and tell her that he could not "cohabit" with her.

The testimony of the three alleged accomplices was now taken. Their conversations on the night of the murder were so vague and circumstantial that they had little influence on the outcome of the case. Then, as the trial was ending, Sarah Stout's brother desired to call witnesses to attest to his sister's spotless reputation; but the Judge, wearied by the excessively long testimony, prevented this by asserting: "I believe no body disputest that she might be a virtuous woman, and her brains might be turn'd by her passion, or some distemper."[21]

The Jury was out for half an hour; few people were surprised at the verdict—not guilty.

21 *Ibid.*, p. 202. Spencer Cowper's career was not impaired by the trial. Cowper served a number of terms in Parliament and held some important offices. At the time of his death he was Judge of the Common Pleas. The strange death of Sarah Stout was never forgotten. Shortly after Cowper's death, in 1728, a poem appeared entitled: *Sarah, the Quaker, to Lothario, lately deceased, on meeting him in the shades.* This poem champions Sarah in such poignant lines (p. 5):

> In vain his Guilt attempts to shun my Eye;
> From my Reproach he cannot, shall not fly;
> On earth, his Crimes his Eloquence might clear;
> I'll be Accuser, Judge and Jury, Here.

Notes and Events

Edited by Dorothy M. Schullian, Ph.D.*

Plastic Surgery

These lines will record for historians of medicine a facial operation performed in the illustrious tradition of Tagliacozzi. The editor of the department has come to the conclusion, now that nine months have elapsed since the appearance of the editorial "Retrospect and Prospect," that readers have no unsettled problems in medical history, no queries which prey upon their minds and rob them of their sleep. Either they solve all such problems themselves by some method the rudiments of which said editor would be grateful to learn, or reference librarians of unusual quality and ability serve faultlessly and perhaps even anticipate their every need.

It is clear that justification for the title "Notes and Queries" no longer exists. We accordingly return the title, with profuse thanks and some melancholy, to the distinguished British publication from which it was borrowed; and to the new American journal *Civil War History*, which has a department of like name and whose readers do have queries, we extend our most beneficent wishes. The conduct of our department remains, we hasten to add, substantially the same; the surgery is surface surgery only, and the title "Notes and Events" sets forth in fairer fashion what has been for some years the inner content of these pages. A salute to Tagliacozzi, therefore, and a renewed invitation to our readers to send notes, announcements of events future or past, and bibliographical listings for items of interest appearing in publications not ordinarily seen by historians of medicine.

Electroshock Therapy in Ibn-Sina's Canon

A note by the Editor of the Journal (1956, *11*, 229-30) has directed attention to the fact that in ancient medicine electroshock therapy was practised by placing a live torpedo on the patient's head. Recently the learned medical philologist, J. Eben-Odem,[1] noted a reference to this kind of therapy in the Hebrew translation of Ibn-Sina's *Canon* (Naples, 1491-92). For the purpose of this present brief note it would seem more apt to quote the Latin version than the Arabic original or the Hebrew translation by Nathan Ha-Meati (1279).[2] I have used the 1527 Junta edition, Venice (Liber 2, Tract.2, cap.591, fol.120 a):

* Cleveland, Ohio.

[1] Eben-Odem, J., "Our medical language," *Harefuah*, 1956, *51*, 23-4.

[2] Leibowitz, J. O., "Avicenne en hébreu et le manuscrit de Bologne." *Comptes rendus du XIII^e Congrès International d'Histoire de la Médecine*, Nice, 1952 (Bruxelles, 1954), p. 131-3.

"*Rahadat.* Membra capitis. Dicitur quod rahadat positus super caput patientis soda, removet soda. Galenus vero inquit. Existimo quod ipsa facit illud dum est viva, mortuam enim iam expertus fui, et nihil inveni."

This I have rendered into English as follows: ". . . It is said that when the rahadat (torpedo) is placed on the head of a patient suffering from soda, it removes the soda. Galen [cf.Kühn XII. 365] states: 'I presume that it does so while it is alive, for I have already made the test with one that was dead, and I attained nothing.' "

Thus the author emphasizes that only the living fish may be used, just as Scribonius Largus, about 48 A.D., mentioned a "live" torpedo, as pointed out in the above-mentioned note.

But what kind of illness is "soda"? The Hebrew translator renders it frankly: epilepsy (kipayon). This strange rendering may be corroborated by the following quotation from Dāwūd al-Anṭākī (d. 1599 A.D.) in his book Tadhkira (Vol. 1, p. 155, Cairo, 1325 A.H.): "If (the torpedo) is brought near, while alive, to the head of an epileptic, the latter will be thoroughly cured." However, the second use of the fish is described by the same author as follows: ". . . it removes chronic headache, unilateral headache, and vertigo even in desperate cases."

Du Cange in his famous dictionary of medieval Latin defines *soda* as "Morbus capitis; Gall. *la Migraine.*" Since he states that it is an Arabic word, I appealed to an Arabic scholar to rescue me from a philological perplexity. Dr. L. Kopf, Hebrew University Library, was so kind as to explain to me that the term *sudā'* is the usual word for headache. If the Latin "soda" could be the transliteration of the Arabic *sawdā,* which means melancholy, then it would appear that Ibn-Sina approaches closer to the present-day indications for electroshock therapy, namely, in mental disease, than the classical authors whose methods of application of the torpedo he relates. However, my Arabic consultant has not been able to give philological support to this flattering conjecture of mine.

The torpedo had already been mentioned by Plato in his *Menon* (80a), where Menon complains to Socrates that their discussion makes him mentally confused, just as the seafish "narke" paralyses and makes one numb. Hence the term narcosis, much as the Latin torpedo ("torpere," to be numb).

JOSHUA O. LEIBOWITZ

Was Goitre Present in New Zealand before the Coming of Europeans?

The question whether goitre was present among the Maoris before the coming of Europeans is not merely of academic interest. If the disease was not present among the Maoris, its present prevalence can scarcely be due to a lack of iodine, and other hypotheses should be examined. The present paper attempts to review the evidence regarding the early history of goitre in New Zealand and to controvert current misconceptions.

Hercus, Benson, and Carter wrote:

> Enquiry from old Maoris established the fact that goitre has been prevalent in this region (Urewara, I.G.) for a considerable period, certainly before European occupation of New Zealand, in spite of numerous published statements to the contrary. This fact was later confirmed by Sir Maui Pomare, Minister of Public Health, who pointed out that the Maori language has contained the name "tenga" meaning goitre for many generations. The disease occurred amongst such isolated tribes as the one under investigation and was unknown among the coastal tribes, where fish and edible seaweed bulked largely in the dietary.

One may wonder how Sir Maui Pomare could know that the word "tenga" meant goitre for many generations. Even in a language that has a written and printed literature, words have changed their meaning with time so that the original meaning becomes no longer generally known and instances of its older use are often misunderstood: e.g., the word "proves" in "The exception proves the rule."

The Maoris seem to have three words that have been used to mean goitre: tenga, ngene, and pukaki. The history of the meaning of these words, as mentioned in dictionaries, is enlightening. The earliest listing of any of them as meaning goitre seems to be that of pukaki, in 1891 (Tregear). It was then defined as a wen, a goitre, a scrofulous swelling in the neck. It was said to be derived from "pu," a bundle, and "kaki," the neck. In the same book, ngene was defined as a scrofulous wen. Twenty years later (Stowell) it meant goitre, but in 1917 it was stated (Williams, H. W.) to mean (1) a scrofulous wen; (2) wrinkle, fold; (3) fat.

Tenga has a longer history in the dictionaries, appearing in 1844 (Williams, W.). However, in that year, in 1891 (Tregear), and in 1911 (Stowell), the only meaning given was Adam's apple. Not until 1917 (Williams, H. W.) was it listed as meaning goitre and then only as the *third* of *six* meanings. The others were (1) Adam's apple; (2) crop of a bird; (4) distended or strained; (5) gorged; (6) extinguished. In 1924 (Best), it was used to mean goitre and also the crop of a bird.

We have on the other hand at least three statements (Polack, Thompson, Thomson), dating from 1840 to 1855, that the Maoris did not have goitre. These statements are corroborated by the failure of other writers (Bell, Dieffenbach, Shortland, Taylor, Tuke), who described extensively the physique and diseases of the New Zealanders, to mention the presence of goitre, even at a later date. The disorder was first mentioned as occurring in 1879 in two isolated places, among the Urewaras and among the whites at Bealey (Newman).

Apart from the assertions of Hercus and his associates, the only published statement that goitre was known to the Maoris before the coming of Europeans is that of Elsdon Best (1924). He wrote: "Goitre was certainly known here in former times . . . ," but *gave no authority*. At that time, Best was presumably under the influence of the "iodine-lack" hypothesis, and his

statement has probably no more significance than the similar one by Stone in regard to the American Indians, which Stone later retracted (Greenwald, 1945).

Twenty years earlier, Best (1904-05) had dealt with the diseases of the Maoris at as great length as in 1924. He did not refer to the occurrence of goitre at an earlier period. In fact, he wrote (p. 217): "There can be no doubt that the Maori of old was troubled with but few diseases. . . . Yet for centuries the people preserved their health, vigor and strength among such inhospitable surroundings—indeed were ever noted for their robust forms and fierce nature. . . . My worthy old tutor, Hamiora Pio, of the children of Awa, who was born in 1823 and died in 1902 . . . gave me his views on the subject of the old-time Maori, its cause and decadence, as also how to recover it."

While the early accounts of the Maoris agree that goitre was not present at least as late as 1840 and 1855, they also agree that scrofula was prevalent and was probably of European origin. Hercus (1955) has confused the two. He quoted from Bell: "The Maoris and half-castes used to suffer from a peculiar goitre-like fungating swelling on the side of the neck, called 'Ngene' or 'Puku.' Fifteen or twenty years ago it was not uncommon; it is now rare. . . . I can remember having seen the disease twenty years ago." But Hercus omitted the final sentence: "From memory, it seemed to be a swelling of the cervical glands, probably scrofulous."

Hercus also wrote that Tuke "refers to a strumous ophthalmia and later to diseases of the eye betraying a strumous origin. While this does not specifically refer to goitre, the signs seem reasonably convincing perhaps that a thyroid condition existed. . . ." The entire passage reads (Tuke, p. 221):

> The grand cause, however, of the decline of the Maori nation is scrofula, with all its attendant evils,—the melancholy result being apparent to the most casual observer on visiting a native village; at every turn the hacking cough and distressed breathing of phthisis reach the ear, the stain of struma may be seen evidenced by necks scarred, or exhibiting open sores, and the frequent occurrence of strumous ophthalmia; the children are almost invariably pot-bellied and ill-nourished, and teeming with vermin, the result of neglect and filth. It is a sad fact, but only too true, that fully fifty per cent of the Maori population shows traces of scrofula, manifested in one or other of its varied symptoms.

The word "struma" can mean either scrofula or goitre. It is perfectly clear that to Tuke it meant scrofula. Many other diseases are mentioned by Tuke on subsequent pages, but goitre is not among them. There is accordingly no credible evidence that goitre was present in New Zealand before the coming of Europeans and, indeed, not for many years thereafter.

In other publications, I have shown that goitre was not present in the Americas, in the Philippine Islands, in Ceylon, nor in most of Africa before the coming of Europeans. These facts, in themselves, discredit the hypothe-

sis that endemic goitre is due to a lack of iodine. In still other publications I have examined the evidence purporting to support this hypothesis and have found it invalid.

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Isidor Greenwald

Clifford Allbutt's Description of Psychomotor Seizures

It is not commonly realized that Thomas Clifford Allbutt, the Regius Professor of Physic at Cambridge (1892-1925), was as eminent a neurologist as he was cardiologist and general practitioner. He was among the first to recognize the motor area clinically, and his monograph on the ophthalmoscope published in 1871 was not only the first clinical treatise on the device introduced in 1851 by Helmholtz, but also a landmark in the history of neurology.

In 1881 Sir William Gowers published his now all-but-forgotten book entitled *The border-land of epilepsy*. The purpose of this note is to direct attention to several remarkable cases of this type of psychomotor seizure which were described by Sir Clifford in *The Times* of London for 31 August 1922 under the caption, "Insanity and Crime—Cases of Unconscious Action."

Sir,—The letter of Sir Robert Armstrong-Jones in your columns of the 26th inst. on criminal responsibility is so important, and the matter, as he says, of such deep public concern, that I venture to add some further observations.

Sir Robert dwells chiefly upon epileptic automatism, a state so marvellous, and to the inexperienced so incredible, as to need the closest examination. Sir Robert alludes to the Otley case as a crucial one. As I am perhaps the only person now living who was concerned in it, I may tell the story, premising that it was but a startling example of a state too frequent to be disregarded. It may be said that in the Otley case the issue of life and death strained the evidence. Let me therefore prepare the reader by cases in which the evidence was wholly disinterested.

Mr. Z., adolescent, subject to mild epileptic attacks, was brought to me by his two sisters, who said that seizures of another order had taken him. For example: with his sisters he had called at a house where they were not well known. Tea was served, when Mr. Z., uninvited, and before any other guest, rose from his chair, poured out tea for himself, took a portion of muffin, and walked off to a distant chair. The sisters whispered one to the other, 'Jack's in a fit.' Here Mr. Z. broke into the narrative saying, 'You may imagine my bewilderment on finding myself seated in two distant chairs at the same moment'! Here was a case of quite disinterested evidence—one of a convulsion of the mind.

A hospital patient walked some distance to a workshop; there he took out a pistol, loaded it, and went off by another way when, coming to himself, he was amazed, and retraced his steps before any harm was done or consciously intended. Here, again, the carefully-sifted evidence was wholly disinterested.

Now for the Otley case! A.B. was a farm labourer known to be subject to epilepsy. He was known also to be a poacher. On a certain day a policeman was walking in the direction of A.B.'s house, whether to visit the house or not could not be known, for A.B. went up into his bedroom, took up his gun, opened the window, and shot the constable dead. When in the hubbub A.B. was seized he declared he knew nothing of what had happened, a protest, of course, utterly derided. He was in due course committed to the Leeds Assizes.

In Otley at that time lived and practised Dr. Ritchie, one of those shrewd, clever, kindly, and devoted family doctors who are a glory of our profession. A.B. was his patient, and to the scorn of the town, Dr. Ritchie expressed his conviction of the truth of the man's defence. He urged that this 'epileptic' had on one occasion risen at night from bed, harnessed a horse to a cart, driven it along a road, and ultimately into a ditch. He remembered nothing of the matter. On another day he was found forking over a midden, exclaiming that a hare had run into it; yet when called to himself he was unaware of what had happened. And so on for other like occasions.

Dr. Ritchie spared no pains in this man's defence. I examined the patient and gave evidence in the witness-box in support of Ritchie's opinion. Frank Lockwood defended; I think Mr. Justice Cave was on the Bench, but I am writing away from memoranda; at any rate, the summing-up was very careful and well balanced. The jury acquitted the prisoner on the plea of insanity, and he was committed to one of the West Riding asylums, where, as a visiting justice, I found him some time afterwards, but blind. The doctor told me that a few weeks after admission in a fit of un-

consciousness he had gouged out both his eyes, to his own terrible distress on his coming to himself. In another asylum, after a long conversation with a very intelligent and well-mannered man, I asked the superintendent why he was detained. The answer was: 'He is the most dangerous man in the house; mild and good now as you see him, but in certain automatic states homicidal.'

I admit the awful difficulty of doing justice in some cases of this kind, many of them more subtle and obscure than in my selected examples. Heraclitus said that a city must defend its law as it defends its wall; but he was also a great prophet of dynamics, and would have taught that the static mind of the lawyer must perforce come to terms with the dynamics of biology.

I am, Sir, your obedient servant,

/S/ CLIFFORD ALLBUTT

St. Ives, Cornwall, Aug. 28.

J. F. F.

Frère Jacques

The reactions awakened even in his own day by the lithotomist who called himself Frère Jacques were many and varied. Controversy about him and his methods continued after his death, and the literature concerning him is extensive. Dr. John Keevil now adds the document which is printed below; he has transcribed it from Sloane MS. 1709 in the British Museum, ff.125-6, where it occurs in the midst of a number of miscellaneous and unclassified papers, most of them in a variety of sixteenth century hands, in a large folio volume. It is in a secretarial hand, and he suggests that it was made for Sir Hans Sloane by a secretary not wholly familiar with French.

The document is listed under Jacques de Beaulieu in Edward J. L. Scott's *Index to the Sloane Manuscripts in the British Museum* (London, 1904), p. 45, where this "Nouvelle methode de l'extraction de la pierre" is dated 1697. Another account, of 1699, is listed by Scott for *Fr.* 4078, f.140. Both these, and any other manuscript account which may come to light, must ultimately be compared with what we know from such printed sources as "Part of a letter from Mr. Bussiere to Dr. Sloane, wherein he gives an account of the new way of cutting for the stone by the Hermit, with his opinion of it," (*Philos. Trans.*, 1699, *21*, 100-06); Jean Méry, *Observations sur la manière de tailler dans les deux sexes pour l'extraction de la pierre, pratiquée par Frère Jacques* (Paris, 1700); Barthélemy Saviard, *Nouveau recueil d'observations chirurgicales* (Paris, 1702), Obs.109, pp. 454-68; Pierre Dionis, *Cours d'opérations de chirurgie* (Paris, 1707), pp. 202-11; James Douglas, *The history of the lateral operation* (London, 1726); and Vacher, *Histoire de Frère Jacques* (Besançon, 1756).

The text as it occurs in Sloane MS. 1709 follows:

Frere Jaques, Hermite flamand, vint a l'Hotel Dieu, Samedy 7e Decembre 1697 accompagné de trois gardes, que Mr. Bontems Gouverneur de Versailles lui avoit donné. On conduisit ce nouvel Operateur dans la Chambre des Morts, ou il en fit coucher un sur le dos, les genoux eleves, et les

cuisses ecartées, qu'il fit tenir par deux Serviteurs. Il fit entrer dans la Vescie par la Verge une Sonde courbe non canelée, dont il tourna le dos du costé du Rectum, qu'il pressa avec le dos de la Sonde, pour le ranger le plus qu'il peut de peur de le couper, faisant bander la peau sur le dos de la Sonde. Il fit entrer son Bistoury, qui coupe des deux costes un pouce avant dans la Vescie, proche son col, ayant fait son incision a coste de l'Anus. Il introduisit en suite le doigt index dans la Playe, pour toucher la Pierre, qu'on y avoit mise par l'*Hypogastre*. Il introduisit dans la Vescie sur son doigt un *Conducteur*, sur lequel il conduisit une Tenette, avec laquelle il tira la Pierre tout d'un coup, sans tirailler a droit et a gauche pour la faire sortir, comme il arrive dans l'operation ordinaire. On coupa ensuite les os des Isles, pour mettre la Vescie a nud, afin de voir par ou le couteau avoit passé. L'ouverture que le couteau avoit fait dans la Vescie, estoit immediatement au dessus des *Prostates*, de sorte que le col de la Vescie n'etoit point coupé, mais seulement le fond, et toute l'operation se trouva fort bien faite.

Le Mardi matin 10 Decembre, frere Jaques vint encore a l'Hotel Dieu pour y faire ses experiences sur un cadavre d'homme, et sur celui d'une femme. Apres qu'il eut fait ses operations, on coupa les os des Isles, pour mettre la Vescie a nud, et voir ce que s'etoit interieurement passé. On trouva que la Vescie de l'homme avoit esté percée en deux endroits, les *Erecteurs*, et les *Accelerateurs* avoient esté coupes, et le col de la Matrice de la femme avoit aussi esté coupé. Mais ces accidens ne doivent pas faire desesperer de la reussite de cette nouvelle methode, qui est fort bonne, pourvu qu'on puisse trouver le moyen d'eviter ces accidens. Par cette operation il n'arrivera plus de fistules parce que l'urine ne passe point par la playe, comme il arrive par l'ancienne methode. Les douleurs de l'operation ne sont point si grandes, parce qu'on ne tiraille point pour faire sortir la pierre par la playe, dou elle sort tout d'un coup, et sans aucune difficulté. Cette operation se fait en tres peu de tems, et par l'ancienne methode elle est fort longue. La playe se reunit en fort peu de tems, parce que les urines n'y passent point. S'il reste quelques sables, ou fragmens de Pierre, ils sortent aussi bien par cette playe que par celle qu'on fait ordinairement au *Pennées*. Le frere a asseuré, que cela luy etoit toujours arrivé dans toutes les operations, qu'il a faites sur les vivans.

Ce frere a de belles Attestations de l'Hopital de Dijon ou il a taillé et gueri plusieur Malades. Il a aussi heureusemt fait cette operation a Fontainebleau, ce qui l'a fait connoitre au Roy, a qui l'Hermite s'est plaint de ce que le Chirurgien de la Charité de Paris l'avoit refusé de le laisser tailler; ce que le Roy a trouvé mauvais. Ce frere est retourné a Dijon dans l'esperance d'etre rappellé au Printems, pour tailler sur les vivans a Paris.

On a fait le raport a Mr. le premier President de tout ce qui s'etoit passé, lequel a donné ordre a trois ou quatre chirurgiens de se bien exercer sur les morts, et de luy proposer tous les accidens, qui leur arrivereront, et tous les moyens, qu'ils auront penser pour les eviter.

La Sonde, dont le frere se sert, est faite comme celles, dont on se sert ordinairement, sinon qu'elle n'est point canellée, et qu'elle est un peu plus courbe. Son Bistoury est tout plat, il coupe des deux costes, et ressemble a la pointe d'une epée platte, a laquelle on auroit mis un manche, qui ne se ferme point: cet instrument ressemble a un poignard.

La Tenette est comme celle dont on se sert ordinairement, sinon qu'elle est plus large, plus courbe par le bout, plus creuse, et ressemble a deux cueilliers, qui ne serient ni trop larges, ni trop creuses.

Son *Conducteur* est un fer rond, qui a un anneau au bout qu'il introduit dans la Playe: mais cet anneau lui sert fort peu, le doigt suffi, parcequ'on fait une assez grande Playe, qui ne fait pas de ressort dans l'endroit ou on la fait comme il arrive au *Pennée.*

Cet Hermite ne vit que de Bouillon froid, et de pain trempé dans de l'eau.

News on Coiter

Since my little book on Coiter[1] appeared, a few supplementary details have come to my knowledge which I present here in three groups.

Coiter was a good balneologist. Balneology, like botany and anatomy, was a new science. All three dealt with the form and the function of nature; nature was to be investigated, described, and considered as a resource of medicine. From Klaus König, who is writing the biography of Coiter's friend Georg Palm, I learn that Palm possessed a copy of Andernacus, *Commentarius de balneis* (Strassburg, 1565).[2] Palm had the habit of making notes on everything of interest which came to his attention. The books of his library are copiously annotated with his own remarks, and these in turn reflect his eminent scientific mind. In the standard balneological work of Andernacus, Palm wrote:

Doctor Volcherus scripsit ad D. Camerarium haec. Uterque medicus in Jochimstal Joann. Albertus et Bernardus Rascher constituunt in Thermis Carolinis Calcem sulphur, sal nitrum et alumen, at ego nulla via potui alumen deprehendere, sic nec sulphur sed sulfureum quaendam halitum odore percepi, at refrigerata aqua si igni adhibeatur sulphureum omittebat halitum.

(Dr. Volcher wrote this to Dr. Camerarius: Both doctors of Jo [a] chimstal, Johannes Albertus and Bernard Rascher, find in the water of Karlsbad [in Bohemia] lime, sulphur, nitre and alum. I on the contrary could find no trace of alum or sulphur, but I noticed a certain sulphurous exhalation in the odor. However when the water was refrigerated and then warmed again, it lacked all sulphurous scent.)

From these lines it is clear that Coiter must have been himself at Karlsbad and must have investigated the water in the way well known to all learned doctors of his time. It should be remembered that serious scientific investigation, however, was as rare as were the really learned doctors. Coiter in any case was not wrong here, for the Karlsbad springs include sulphur, but in the form of sulphates, which could not be recognized as sulphur with the rude methods of investigation known in the sixteenth century.

On page 110 of my study on Coiter I could report that, although Coiter's own library must have been scattered, one of his books was preserved in the Trew Library at Erlangen. It is adorned with Coiter's autograph. Dr. König has called my attention to another item from Coiter's

[1] *Volcher Coiter 1534-1576* (Nürnberg, 1952).
[2] Stadtbibliothek Nürnberg, Med. 4o.8°.

library. It is a copy of Jacobus Hollerius, *De morbis internis libri II* (Paris, 1572).[3] The title-page bears Coiter's autograph, "Volcheri Coiter medici." Coiter apparently gave the book to Palm, who pasted in his own ex libris. Both Coiter and Palm wrote numerous notes in the margins. A third such item, the history of which is far more fascinating, is a copy of Eustachio's *Opuscula anatomica* issued with his *Libellus de dentibus.* Both were printed at Venice in 1563. This volume, now Sign. P 142 in the library of Erlangen University, and formerly in the possession of Dr. Trew, bears a note in Coiter's hand, "Bononiae an. 1.5.6.3. 3° Decemb." The line is struck out, probably by Coiter himself, and below it Coiter wrote a dedication for Dr. Joachim Camerarius:

Clarissimo et ornatissimo viro doctrina et virtute praestanti D. Joachimo Camerario iuniori Philosopho ac Medico eximio domino ac amico suo cum observantia colendo d. d. Volcherus Coeiter Frisius Groeningensis ām 1570. i. februarij Nurinbergae.

Eustachio's books must have been out of print in 1570 or at least unobtainable in Nürnberg. Coiter therefore made a precious present to his old friend Camerarius in inscribing to him these two rare pieces, which he had purchased in Bologna shortly after his return from Rome. He had gone to Rome to see Eustachio. If we consider the date of the inscription, we notice that the volume was presented four months after Coiter's contract with the senate of Nürnberg had been arranged (dated 6 October 1569). We know that Camerarius was the most influential of Coiter's intercessors in Nürnberg, and I assume that the gift was intended to express Coiter's thanks for his assistance in this regard.

Dorothy M. Schullian[4] listed some of the copies of his own works which Coiter presented to friends and to various influential persons. There are two further examples:

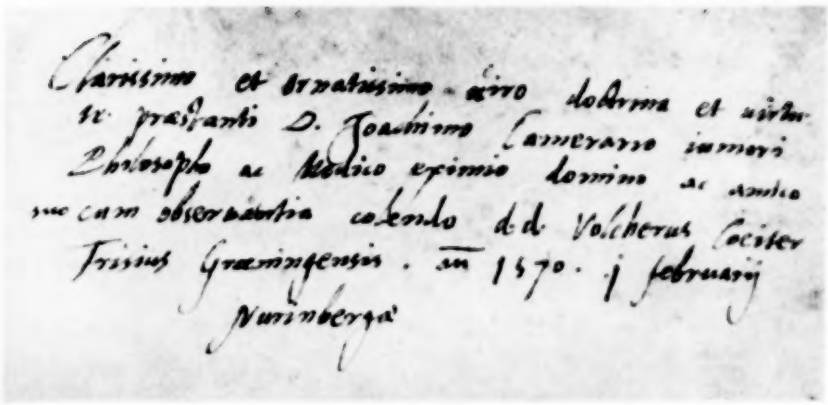
1. *Externarum et internarum principalium humani corporis partium tabulae* (Nürnberg, 1572).[5] "Clarissimo ac ornatissimo viro D° Georgio Palm Philos: ac Medic: doctori excellentissimo Noribergensium Physico D° et collegae suo colendo autor D.D."

2. *Lectiones Gabrielis Fallopii* (Nürnberg, 1575).[6] "Claris° Viro eruditione et virtute praestanti D Georgio Palm Philosophiae ac Medicinae Doctori ac Reip: Noriberg: Physico D° amico et Collegae suo observando autor D.D."

We note with pleasure that Coiter in 1575 speaks of Palm as his friend. This was not yet the case in 1572. Dr. Georg Palm had drawn one of the engravings for this work, Tab.III, "Sceleton Pulli Gallinacei Monstrosi."

ROBERT HERRLINGER

3 Stadtbibliothek Nürnberg, Med.201.8°.
4 This Journal, 1951, *6*, 176-94.
5 Stadtbibliothek Nürnberg, Med.103.2°.
6 Stadtbibliothek Nürnberg, Med.104.2°.



Clarissimo et ornatissimo viro doctrina et virtute praestanti D. Joachimo Camerario summo Philosopho ac Medico eximio domino ac amico suo cum observantia colendo d.d. Volcherus Coiter Frisius Graeningensis. an 1570. 1 februarij Norimbergae

FIG. 1.

EXTERNARVM
ET INTERNARVM PRINCIPALIVM HVMANI CORPORIS PARTIVM TABVLÆ,
ATQVE ANATOMICÆ EXSECTIONES OBSERVATIONESQVE VARIÆ, NOVÆ, DIVERSÆ, AC ANTEHACTENVS NVSQVAM EDITÆ.

AVTORE VOLCHERO COITER FRISIO
GRONINGENSI, INCLYTÆ REIPVBLICÆ NORIBERGENSIS MEDICO PRIMO ET CHIRVRGO.

AD AMPLISSIMVM ET PRVDENTISSIMVM VIRVM [redacted]

TABVLARVM, FIGVRARVM, ET OPVSCVLORVM, QVÆ IN HVIVS LIBRI COMPENDIVM INCLVSA SVNT, ELENCHVS ET ORDINIS POST PRAEFATIONEM TABVLÆ IMPENSIS.

CVM GRATIA ET PRIVILEGIO CAESAREÆ MAIESTATIS, AD ANNOS XIII.

NORIBERGÆ,
IN OFFICINA THEODORICI GRATARENI.

M. D. LXXII.

Clarissimo ac eruditissimo viro D. Georgio Fabricio Chemnicensi Medico doctissimo amico suo observantissimo D. D. D. autor D. D.

FIG. 2.

LECTIONES
GABRIELIS FALLOPII
DE PARTIBVS SIMILARIBVS
HVMANI CORPORIS, EX DIVERSIS EXEMPLARI
BVS A VULCHERO COITER LVCCA CVM
DILIGENTIA COLLECTAE

HIS ACCESSERE DIVER-
SORVM ANIMALIVM SCELETORVM EXPLICA-
TIONES ICONIBVS ARTIFICIOSIS, ET GENVINIS ILLVSTRATAE,
quae omnes hoc oppido Academiae artem exercentium prius edi-
tum, Anatomiae & Philosophiae naturalis studiosis re-
ferre volui possent.

AVTORE EODEM VOLCHERO COITER FRI-
SIO GRONINGENSI, INCLYTAE REIPVBLICAE
NORIBERGENSIS MEDICO PHYSICO
ET CHIRVRGO.

Ad Amplissimum & Prudentissimum inclytae urbis
Norbergensis Senatum.

CVM GRATIA ET PRIVILEGIO CAESAREAE
MAIESTATIS, AD ANNOS XII.

NORIBERGAE
IN OFFICINA THEODO-
RICI GERLACHII.

M. D. LXXV.

FIG. 3.

Avicenna

In 1955 the publisher Sansoni of Florence issued two volumes entitled *Medioevo e Rinascimento: Studi in onore di Bruno Nardi.* Of great importance to medical historians is the article "Avicenne et les médecins de Venise" in Volume 1, pp. 177-98. It is written by Marie-Thérèse D'Alverny and examines the interest in Avicenna at Padua and Venice in the fifteenth and sixteenth centuries. The interest manifested itself first through mediaeval Latin translations and then directly through the Arabic; Giovanni Marcanova, physician and antiquarian of Padua who on his death in 1467 left his manuscripts to San Giovanni di Verdara there, had a part in it, and it will be remembered that from the presses of Padua and Venice in the fifteenth and sixteenth centuries issued numerous editions of the *Canon.*

Visitors to Belluno, in the region a little north of Venice which is so historic for its associations with World War I, can still see today in Via S. Lucano the house of Avicenna's translator Andrea Alpago (1450-1520); its façade is marked by a bust of Alpago, in Oriental costume, set unfortunately so high on the wall that it cannot be photographed properly from the street. The inscription on the scroll beneath the bust reads: ANDREAS ALPAGVS/ VIR GENERE CL. QVI/ LINGVAE ARABAE/ PERITISS. AVICENAM/ AB INFINIT. ERRORI/BVS VENDICAVIT/ PATR. FAMIL.Q. DECVS/ PERPET. M.D.LXVI.

In *News to the Friends of the Library of the History of Medicine,* University of Kansas Medical Center, June, 1956, Dr. Ralph H. Major gives an interesting account of his visit in April to the tomb of Avicenna in Hamadan.

Dr. Erwin H. Ackerknecht Accepts Position at Zurich

Dr. Erwin H. Ackerknecht, who for the last ten years has been Professor of History of Medicine at the University of Wisconsin, has just accepted the professorship of the History of Medicine and Biology at the University of Zurich. He will also be the Director of the Institut für Medizingeschichte, which owns a rather large museum collection.

Ackerknecht was graduated in 1931 at Leipzig under H. E. Sigerist with a thesis on the Medical Reform Movement of 1848. From 1933 to 1941 he lived in France where he received a diploma in ethnology from the Sorbonne in 1939. He came to the United States in 1941, and, before going to Wisconsin, was connected from 1941 to 1944 with the Johns Hopkins Institute and from 1945 to 1946 with the American Museum of Natural History. He has published the following books: *Malaria in the Upper Mississippi Valley 1760-1900* (Baltimore, 1945), *Rudolf Virchow* (Madison, 1953), *A Short History of Medicine* (New York, 1955), *Franz Joseph Gall and his Collection* (Madison, 1956), and eighty papers.

Dr. Lloyd G. Stevenson Appointed Dean at McGill

The Journal is happy to announce the appointment of Dr. Lloyd G. Stevenson, member of its Board of Editors, as Professor of the History of Medicine and Dean of the McGill University Faculty of Medicine.

H. Winnett Orr 1877-1956

It is with regret that the Journal announces the death, on 11 October 1956, of Dr. H. Winnett Orr of Lincoln, Nebraska. With the exception of two years of military duty abroad in World War I, Dr. Orr had been in active practice in the orthopedic field in Lincoln since 1899. His special historical interest, awakened during his duty abroad, was in Anne of Britanny, but he collected also in the general history of surgery and orthopedic surgery. He knew Vittorio Putti, and the two had a common bond in their devotion to orthopedics both early and current. Dr. Orr was buried in Arlington National Cemetery.

Centennial of the Academy of Medicine of Cincinnati

The Academy of Medicine of Cincinnati, Ohio, will celebrate its hundredth anniversary during the week of 27 February through 5 March 1957. As the official observance of the occasion a Health Museum and Exposition, which will include 175 health and scientific exhibits, will be established in Cincinnati's historic Music Hall. Notable among these exhibits will be one from the American Museum of Atomic Energy entitled "Atoms for Peace." Also the Dominican Republic has loaned a full-sized activated manikin, "Juno," operated electrically, which will demonstrate blood vessels, bones, and organs of the body.

The Convocation address on 5 March will be given by Sir Edward Appleton, Nobel Laureate, of Edinburgh, Scotland, and Drs. Paul D. White and Walter Alvarez will be among the guest speakers. The *Cincinnati Journal of Medicine* has prepared a special centennial edition, and Professor Reginald McGrane, Chairman of the Department of History of the University of Cincinnati, has written a history of the Academy entitled *The Doctor's Forum,* copies of which will be available at the Exposition.

History of Science Club in Washington, D. C.

The Journal is glad to announce the formation of a History of Science Club in Washington, D. C., under the co-operative effort of Morris C. Leikind (Historical Research Division, Medical Museum, Armed Forces Institute of Pathology), Robert P. Multhauf (Department of Engineering and Industries, Smithsonian Institution), and Raymond J. Seeger (National Science Foundation).

The first meeting was held on 6 December 1956 at which two papers were presented: Dr. Raymond D. Stites, Curator of Education at the

National Gallery of Art, chose as his subject "The Origins of Art and Science in the Work of Leonardo da Vinci," and Mr. Morris C. Leikind spoke on "Aniline Dyes—Their Impact on Biology and Medicine."

Osler Medal Contest

The William Osler Medal Committee of the American Association of the History of Medicine, consisting of George J. D'Angelo, Charles D. O'Malley, and Dorothy M. Schullian, *Chairman,* invites students of medical schools in the United States and Canada to submit essays on some phase of medical history in competition for The William Osler Medal of 1957. The Association will consider unpublished essays by men and women who were students in schools of medicine and had not yet obtained their doctor's degree at the time the essay was written. To be considered, an essay must be submitted before or within one year after the author's graduation. Essays which are the result of original research will be given preference, but the Association will also consider essays which, without being the result of original research, show an unusual appreciation and understanding of historical problems. Essays should not exceed 10,000 words in length and must be submitted before 1 March 1957.

Milestones in the History of Medicine in the Pacific Northwest

The attention of the Journal has been directed to a special exhibit placed on display at the Clinical session of the American Medical Association held at Seattle between 27 and 30 November 1956 under the title "Milestones in the History of Medicine in the Pacific Northwest." The official program shows a good reproduction of the three more important figures, John S. Helmcken, Marcus Whitman, and John McLoughlin.

The exhibits were varied, beginning with one on medicine among the American Indians showing the charms, rattles, and fetishes of the Shaman, the Indian medicine man. There were also on display exhibits of skull trephining, head flattening, and the sugar-loaf skull. This was all prehistoric.

The second exhibit had to do with medicine during the early explorations and memorialized George W. Steller, physician and naturalist who landed on the coast of Alaska on 16 June 1741, Dr. John Mackay who landed on Vancouver Island in 1786 and became the first resident practising physician of the Pacific Northwest, and Dr. Archibald Menzies who made a voyage to Nootka Sound in 1790 and for whom the *Arbutus Menziesii* was named.

The third period found in the exhibit is that of the Hudson's Bay Company, the fourth, the missionary period, the fifth, that of the early immigrant physicians, and the sixth, the "period of modern transportation and industrial development," the latter two spanning the years from 1843 when William Cameron McKay established his medical practice in Oregon

down through a formidable series of other worthies to 1946 when Edward L. Turner became the first dean of the University of Washington School of Medicine, and the Faculty of Medicine at the University of British Columbia at Vancouver was established under the deanship of Myron Weaver.

Bibliography of Nicholas Culpeper (1616-1654)

The large collection of works and editions of Nicholas Culpeper in the Yale Historical Medical Library reflects Harvey Cushing's long interest in the writings of that enthusiastic populariser of medical knowledge. There is a similar, and in many ways complementary, collection in the Wellcome Historical Medical Library in London, and Professor John Fulton and Dr. F. N. L. Poynter have agreed to collaborate in the preparation of a definitive bibliography. The preliminary checklist, which fills 57 pages of typescript, is too long to circulate to other libraries, but librarians are asked to report their holdings of Culpeper items to Miss Madeline E. Stanton at the Yale Medical Library (333 Cedar Street, New Haven 11, Connecticut). Descriptions may be very brief, but should include the names of printers and/or booksellers as they appear in the imprint, and the number of preliminary (and any unnumbered) leaves as well as of pages. Translations with which he was said to be associated (e.g. Bartholin, Fernel, Galen, Glisson, Jonston, Morel, Partlitz, Phaedro, Plater, Prevot, Riolan, Riviere, Ruland, Sennert, Vesling, and Wecker) should be included, together with works known to be spurious but in which his name appears.

Historical Gleanings

Dr. Charles Mayo Goss of the Louisiana State University School of Medicine has received a Guggenheim grant for research on the history of medicine in ancient Greece. Dr. Goss has been Managing Editor of the *Anatomical Record* since 1948 and has edited the last two editions of Gray's *Anatomy*. His special fields are the experimental embryology of the mammalian heart, the histology and tissue culture of muscle, and the gross anatomy of muscles and fasciae. Some years ago his research on muscle led him back to Galen, a number of whose treatises he is now engaged in translating. He is interested also in the biographical aspect and has already studied in Greece the geographical, archaeological, and linguistic background of the period of Galen.

Few are the historians inany field who can write with sufficient authority and general appeal to satisfy the thousands of readers of the *American Historical Review,* organ of the American Historical Association. It is therefore a matter for special mention and congratulation here that the issue of that review for October, 1956, pp. 81-91, carries an article by Richard H. Shryock entitled "The Significance of Medicine in American History."

Dr. Ralph H. Major describes in *News to the Friends of the Library of the History of Medicine,* University of Kansas Medical Center, September, 1956, visits in April to Rhodes, where the Knights of St. John erected in the fourteenth century one of their famous hospitals, and to Cos. Dr. Major's earlier visit in 1934 to Cos and its Hippocratic memorials was recounted in the *Bulletin of the Society of Medical History of Chicago,* 1946, *5,* 323-94; the report was later issued in book form.

This department of the Journal carried in the issue of January, 1956, *11,* pp. 102-3 a note by Ida Macalpine and Richard A. Hunter on Tobias Smollett's knowledge of William Battie's *A Treatise on Madness.* An additional note on the subject is furnished by the same investigators in *Modern Language Review,* July, 1956, *51,* 409-11. Here, quoting the same passages, they suggest that Smollett knew the *Treatise* so well because he was very probably the author of the unsigned notice on it, seven and a half pages in length, which was published in the *Critical Review* for December, 1757 (*4,* 509). The book, though dated 1758, appeared at the end of 1757, and in the review the passage which Smollett later plagarized was singled out for full quotation and ridicule.

The Times, London, 24 August 1956, carried a dispatch from Glasgow announcing an appeal for £20,000 to create an endowment fund for maintenance of the birthplace, at East Kilbride, of William and John Hunter. The farmhouse of white roughcast and crow-stepped gables is occupied by Mr. Thomas Strang, who has kept it in repair so far as he is able, but the sum of £3500 is urgently needed at once to restore its endangered fabric before further deterioration takes place. Contributions may be sent to the Treasurer, Hunter House Memorial Fund, Royal Faculty of Physicians and Surgeons of Glasgow, 242 St. Vincent Street, Glasgow, C.2. It is intended that the house should be eventually a memorial, a museum, a place of pilgrimage, and possibly a research center. The appeal is sponsored jointly by the East Kilbride Development Corporation, Glasgow University, the Royal Faculty of Physicians and Surgeons of Glasgow, and the Western Regional Hospital Board.

On 11 August 1956, *The New York Times* carried an advertisement announcing that the 90-acre site and more than 60 buildings of the Trudeau Sanatorium at Saranac Lake, New York, were available for purchase at $750,000. Medical historians will realize that this sale marks the end of an era in the treatment of tuberculosis. Dr. Milton B. Rosenblatt in a Letter to the Editor of the *Times,* written 12 August and published 27 August, reviewed the contribution of Dr. Edward Trudeau and the rest cure and stressed the point that the newer methods which have supplanted the usefulness of sanatorium care are a tribute to the great work of the Trudeau Sanatorium. "The most lasting contributions were its high standards of medical care and its stimulation of medical research in the fight against tuberculosis."

The full text of Symphorien Champier's will, 30 January 1531/1532, as preserved in the Archives de la Ville de Lyon, Chappe XX, 30 (ex.FF85), p. 7, 6 ff., is published by Jean Tricou in *Bibliothèque d'Humanisme et Renaissance,* 1956, *18,* 101-09. A careful introduction and detailed bibliography are provided.

Certain medical interests of the sixteenth-century antiquary John Leland are uncovered by Leicester Bradner in the course of his article "Some Unpublished Poems by John Leland" in *Publications of the Modern Language Association of America,* 1956, *71,* 827-36. A Bodleian manuscript (Tanner 464.iv) preserves epigrams by Leland to Johann Winter of Andernach, to John Caius, and to a poet and medical scholar referred to simply as Drogo. It contains also an epigram "In frontispicio Auli Macri Sereni," written, that is, for a volume in which the authors Aulus Cornelius Celsus, Macer Floridus, and Serenus Sammonicus were associated.

The lack of scholarly writing about the history of bathing in China has been especially marked because of the contrasting wealth of material on the same subject for Europe. The deficiency has now been in large part remedied in an article by Edward H. Schafer in the *Journal of the American Oriental Society,* 1956, *76,* 57-82. Prof. Schafer outlines bathing customs in the Chou Dynasty and describes important changes in subsequent periods down to the Sung Dynasty. In the case of public baths he continues the story to the Ming Dynasty. Balneotherapy is included, and there is a careful account of the Li-shan hot springs on the lower slopes of Mt. Li. The mists of antiquity shroud the names of the first persons to make use of these healing waters which gained such renown later and are known as the Floriate Clear Palace. They were used especially for diseases of the skin, and arsenic was an important constituent of them.

The jingles by which weary scribes at the end of a manuscript hailed with relief and joy the termination of their labors are examined by Lynn Thorndike in *Speculum,* 1956, *31,* 321-28. A number are quoted from manuscripts of medical authors such as Bruno da Longobucco, Petrus Hispanus, John of Gaddesden, and Guglielmo da Varignana. They are not in themselves medical; in general piety predominates, but they may also begin with pious words and close with a request for a pretty girl or a good cow as payment not excessive for the labor expended.

The etymology of Latin *mentula,* "membrum virile," has long been debated by scholars. In *Classical Philology,* 1956, *51,* 247-9, Gordon M. Messing suggests a connection with **mentare* in the highly specific sense "woo," a sense which was carried by *mentionem facere.* An adjective **mentulus* could have been formed on the analogy of *bibulus, credulus,* etc.; its feminine could then have combined with some such noun as *vis* to mean "wooing ability," and *mentula* itself could have served concretely in the

sense of "wooer." It would have been used in jest as a scurrilous substitute for "membrum virile."

In the *American Journal of Philology,* 1956, *77,* 264-73 Ronald Syme lists twenty friends of the Caesars in the period from Augustus to Hadrian who apparently carried weight in counsel and policy. Included is C. Stertinius Xenophon of Cos, chief physician to Claudius. It was in response to his entreaty that the Emperor, as Tacitus tells us in his *Annals,* XII.61, proposed *immunitas* for Cos.

An article by Brian Rodgers in *Parliamentary Affairs,* 1956, *9,* 188-94 shows that medicine had a place in government and politics also in the nineteenth century. The article discusses the Medical Relief (Disqualification Removal) Act of 1885 in Great Britain, which was designed to remove the disqualification of all those who had received medical relief from all elections except those to the Board of Guardians. Among the points debated was whether the term "medical relief" included "medical extras" such as "wines, spirits, malt, liquor, beef, and other butcher's meat." The measure set a precedent for considerable improvement in poor law administration during the next two decades.

Some of the interests of Politian in medicine have already been mentioned in this journal, 1955, *10,* 120 and 256-7. It is well to add here that his copy of the first edition of Celsus, Florence, 1478, now in possession of the Biblioteca Nazionale Centrale in that city (Inc. Magl. C.2.9.), bears annotations in his hand. A recent description of his activity in this regard is furnished by Alessandro Perosa in the official catalogue, published by Sansoni in 1955, of the Mostra del Poliziano which was held in the Laurentian Library 23 September-30 November 1954. The occasion was the five hundredth anniversary of Politian's birth, and the exhibit was sponsored by the Istituto Nazionale di Studi sul Rinascimento. Item no.58 on display was this copy of Celsus, which on the request of Politian had been collated in 1490-91 by Pier Matteo Uberti with a manuscript of the tenth century borrowed from Bologna and now Plut. LXXIII.1 in the Laurentian Library. The manuscript had also been borrowed earlier, about 1475, for consultation by Bartolomeo Fonzio, who prepared the *editio princeps* for the press. The manuscript itself was item no.57 in the exhibit. Item no.67 in turn was a fifteenth century manuscript in Greek (Laurent. LXXV.8), annotated by Politian, of Galen's *De compositione medicamentorum,* and item no.254, a letter by Politian to Lorenzo de' Medici, 5 June 1490 (Florence, Archivio di Stato, Mediceo av. il Principato, XLII, 87) in which he speaks of having translated Hippocrates and Galen and written a linguistic commentary upon them. If these works have survived, their location is not known to modern students of Politian.

Ecclesia, the illustrated monthly published in the Vatican City, carries in its issue of May, 1956, two articles of interest to historians of medicine.

On pages 262-3 is printed, in French, the address of His Holiness, Pope Pius XII, before the International Congress for the Social Rehabilitation of Lepers. On pages 272-7 Father Antonio Ferrua describes the frescoes found recently in the newly discovered catacomb on the Via Latina. Included is the one cited in this journal, 1956, *11*, 354. On 16 November 1956, Dr. George W. Corner read before the American Philosophical Society a paper based on this fresco and entitled "Physician and Pupils in a Fourth-Century Painting." A brief account of the frescoes from the Reuters agency appeared in *The New York Times* for 7 November 1956, p.27.

In *The Times Literary Supplement* of 5 October 1956, p.585, Cecil S. Emden identifies in a letter by Dr. Johnson (edition of R. W. Chapman, 1952, vol.1, pp.389-90, Letter no.338, to Mrs. Thrale) a quotation from Dr. George Cheyne. The passage, "But every thing is best as it has been, except the errors and failings of our own free will," occurs in Cheyne's *Essay of Health and Long Life,* which Johnson recommended to Boswell. Historians will recall that in the Fielding H. Garrison Lecture for 1949 *(Bulletin of the History of Medicine, 23,* 435-52) Dr. Henry R. Viets presented a careful survey of the life and writings of Cheyne.

Dr. John P. Gray's durable Compound (a sherry tonic, 11% alcohol) received free publicity in Meyer Berger's column in *The New York Times* for 24 October 1956. For 57, 50, and 48 years respectively, with 5, 4, and 5 days of absenteeism respectively, Lizzie Reincke, Martha Koester, and Lucy White have been happily pasting labels on its bottles. Their faithfulness has now been honored in an appropriate ceremony. Question: is their record a testimony to the virtues of the tonic itself?

The staff of Asclepius will have new emblematic life if the device proposed by the World Medical Association, meeting in Havana in October, 1956, is adopted. The emblem suggested, a red serpent and staff on a white background, would serve to protect in time of war civilians engaged in medical work. The World Health Organization, the International Committee of the Red Cross, and the International Committee of Military Medicine and Pharmacy are co-operating in the proposal. Necessary first is recognition of the emblem by each country, and next, as with the Red Cross emblem, international recognition.

On 2 July 1956, as reported by the United Press, President Dwight D. Eisenhower signed legislation which added the name of a Chicago octogenarian to the honor roll of those who with Walter Reed conquered yellow fever. Gustaf E. Lambert was the sole nurse tending yellow fever cases during Major Reed's experiments in Cuba. The legislation entitles him to a gold medal and (belatedly) a pension for life.

The Crown of the Andes, valued at $4,500,000 and containing 453 emeralds with a total weight of 1,521 carats, glowed in an unfamiliar setting

on 11 October 1956, at the opening ceremonies of the new Manhasset store of Franklin Simon. Set on display at the Lambert Brothers Jewelry Department there by Dr. Francisco Urrutia, Colombian Ambassador to the United States, it was impressive not only in its beauty but also in its history. In the year 1590 the people of Popayán alone escaped an epidemic, possibly of smallpox, which ravaged Spanish settlements on the west coast of South America. In gratitude to the Blessed Virgin they vowed for her statue in their cathedral a crown which was finally completed after six years of devoted labor by twenty-four goldsmiths and jewelers. It has survived with beauty unblemished earthquakes, the raids of pirates, the struggle by which Simón Bolívar brought independence to Colombia, and intermittent civil warfare thereafter. More than once, through force or for protection, it has departed its cathedral and later been returned. In 1909 Church authorities decided on its sale in order to raise money for hospitals and orphanages; it was purchased by a jewel dealer of Chicago in 1936 and is now the property of the Crown of the Andes Corporation.

A penetrating re-investigation of Grave 7 from the Middle La Tène Period, Iron Age, which was discovered at Obermenzing near Munich in 1910, is furnished by Dr. J. M. de Navarro of the Department of Archaeology and Ethnology, Cambridge, in *Proceedings of the Prehistoric Society*, 1955, *21*, 231-248. This grave was a cremation burial. The material from it, now in the possession of the Vor- und Frühgeschichtliche Staatssammlung, Munich, includes the usual weapons found with a warrior of that period—shield-boss, spearhead, and sword—, but it includes also three surgical instruments which reveal that the practice of surgery was even then not incompatible with the pursuit of arms. While diversity of interpretation concerning the purposes of these instruments is possible, Dr. F. d'Abreu, Ch.M., F.R.C.S., suggests that the first could have been used as a probe and as a cautery, the second as a retractor and as a snare, and the third as a trephining saw. La Tène surgery probably owed a debt to Alexandrine-Hellenistic influence, but Dr. de Navarro is far from ready to state that these particular instruments were Greek imports; they may very well be native La Tène products. Clear photographs and drawings of them are provided in his article. The costly decorated iron sword found with them suggests that medical fees among these Central European Celts who lived two or three hundred years before the birth of Christ were not inconsiderable.

Book Reviews

CHARLES F. MULLETT. *The Bubonic Plague and England. An Essay in the History of Preventive Medicine.* Lexington, University of Kentucky Press, 1956. vii, 401 pp. $9.00.

Reviewed by F. N. L. POYNTER, *Librarian, The Wellcome Historical Medical Library, London, England.*

THERE has long been a need for a volume which brought together all that was known of the history of plague in England and its influences on the development of modern concepts and practice in public health and preventive medicine. Professor Mullett has now given us a work of this kind, and we must all be grateful for the industry with which he has assembled so many facts from so many scattered sources. In a sympathetic attempt to follow the author's own injunctions to critics I shall not compare it adversely with the still unwritten, ideal book on this important subject but confine my observations to the measure of success with which Professor Mullett has achieved the aims he set himself.

As he so truly remarks, the impact of plague upon society in English history is a factor which has not received the attention from the general historian which it deserves. The Black Death and the last great outbreak of 1665 have been dealt with more or less fully and more or less accurately by a number of historians, but the extent and continuity of the disease in England, especially during the sixteenth and seventeenth centuries, have been passed over in a most cursory manner. As a historian, Professor Mullett sets out to redress this balance, as well as to trace, against the background of plague, the evolution of the sanitary measures which now form part of our system of public health.

His strictly chronological account, which takes us from the fourteenth to the nineteenth century, imposes certain disadvantages on the author which he has not succeeded in overcoming. Each chapter deals with a limited period and follows a more or less standard pattern in which an account of each outbreak, its location, spread and mortality, is followed by a study of the literature, medical and otherwise, which it produced, and of the prophylaxis and remedies recommended or referred to in that literature. Inevitably, since the advance of medical knowledge with regard to plague was very slow, if not stationary, for centuries, there is a good deal of repetition, which makes for dullness, an unforeseen characteristic of any book dealing with the great plague outbreaks. The method also makes it difficult for the author to establish, or the reader to grasp, the significance of the prophylactic measures described in each chapter in relation to the avowed aim of illustrating the development of preventive medicine.

That Professor Mullett is aware of the difficulties and dangers of his task is clear from the fact that he himself quotes Geddes Smith to the effect

that "though laymen are the stuff of which epidemics are made, they shouldn't meddle with epidemiology, which is an exacting science." The epidemiologist will find nothing in this volume to persuade him to dispute this dictum. He would point out that the title itself begs the question. Bubonic is only one of several forms of plague, and although it is generally conceded that bubonic plague probably accounted for most of the outbreaks which come within the scope of this book, there are others which were probably pneumonic. Unfitted as the author may feel himself to be as an epidemiologist, he should, with the aid of reliable guides, have given far greater attention at the beginning of his book to a brief résumé of the present knowledge of plague in all its manifestations, its etiology and mode of transmission. This is the more necessary in that the book will obviously be most valuable to the student of history and literature, who should be given this basic information before he can possibly appreciate much of what follows. All the theories about infection, miasma and contagion, for example, are seen in so much better perspective if at the outset the reader is told that an outbreak of bubonic plague may develop into one of pneumonic plague; that primary pneumonic plague is the most infectious and bubonic plague one of the least infectious of all epidemic diseases. With this information at his disposal the reader is better equipped to perceive the ironies of this history, to observe how time and again people did the right thing for the wrong reasons, and occasionally to wonder why it was that the old beliefs and remedies, which simple observation could so easily disprove, were so long a-dying. The author very rightly points out how sensible were some of the measures which were employed, but he often fails to point out that remedies which he describes as "folklore" or "quackery" differed little if at all from the prescriptions supplied to their patients by learned and orthodox physicians and were in fact derived from some of the most reputable sources of antiquity.

Occasionally there is an apparent misunderstanding which may mislead the reader; e.g. on page 32 we read that "at Oxford each of the leading colleges maintained a pesthouse at some convenient distance, to which the Fellows migrated in time of threat," from which the reader might be excused for assuming that a pesthouse was a refuge from the plague, whereas it was a place for isolating the victims. We are told on page 217 that "such philanthropic enterprises as dispensaries, labor exchanges, the great hospital movement of the late seventeenth century . . . owed much to the plague." As the first dispensary opened its doors in April 1767 and the "great hospital movement" did not begin until the eighteenth century, I do not think that the inception of either had anything to do with plague. I am not qualified to speak of "labor exchanges," which were, I have always thought, a much more recent innovation.

In spite of its weaknesses the work must be commended for its scope. The author has not gone beyond printed sources, but these are many and of a wide range. It is a pity that the book went to press before its author was

able to utilize the moving, first-hand account of a plague outbreak contained in Barbara Winchester's *Tudor Family Portrait* (Jonathan Cape, 1955), but the substantial monograph on the history of plague in Lancashire by R. Sharpe France (*Transactions of the Historical Society of Lancashire and Cheshire,* 1939, *90,* 1-175) seems to have escaped the author's notice. It would have been useful to have the footnote references brought together in a bibliography at the end of the book; the documents printed as appendices should have had some indication of their source; this is given, but only in a footnote halfway through the book.

A glance at the dust-wrapper of this book reminds us that one of the great paradoxes of English history remains unexplained. Reference is made there to "the impoverishment of life and spirit that resulted from the plague's continuing ravages." If the age of Shakespeare and Milton, of Elizabeth and her voyagers, of the earliest settlers in a land which has become the most powerful in the world was "impoverished in life and spirit," then what are we?

Opuscula selecta Neerlandicorum de arte medica, fasciculus duodevigesimus quem curatores miscellaneorum quas vocantur Nederlandsch Tijdschrift voor Geneeskunde collegerunt et ediderunt. Volcher Coiter. Amstelodami, 1955. lxxix, 263 pp., 25 plates.

Reviewed by DOROTHY M. SCHULLIAN.

IT is not alone in their struggle against encroaching seas that the Dutch people reveal time and again a determined and admirable persistence. By this trait, and across the dismaying difficulties of the war years, they have now advanced *The Collected Letters of Antoni van Leeuwenhoek* to its fourth volume. By the same trait they have reached, after similar frustrations, the eighteenth volume in this series of medical classics in text and translation. The series was initiated in 1907; volumes 16 and 17, which appeared respectively in 1942 and 1943, were reviewed in this journal in 1948.

But with the passing of time and long delay in publication the force of the words *omnia mutantur* becomes once more apparent. The task of preparing this volume had been committed in 1937 to Dr. B. W. Th. Nuyens, who had already done pioneer work on the biography of Coiter, and to Dr. A. Schierbeek. Dr. Nuyens died on 20 October 1945, with his valuable essay on the life of Coiter in excellent form. Dr. Schierbeek carried on valiantly, even when corrections graciously made by Dr. Charles Singer in proofs of the English translations of Coiter's contributions necessitated a complete resetting of the type. Meanwhile in America and in Germany (in that order) appeared important investigations of new source material on the life of Coiter which both corrected and supplemented the presentation by Dr. Nuyens. Dr. Schierbeek, wishing neither to disregard these investigations nor to alter the work of his deceased collaborator, has followed con-

scientiously the only course left to him, that of citing in a carefully numbered set of notes and an appendix the main points in these investigations and referring the reader who would probe further to the investigations themselves (this journal, 1951, *6*, 176-194 and Robert Herrlinger, *Volcher Coiter 1534-1576*, Nürnberg, 1952, reviewed in this journal, 1954, *9*, 253-255).

In addition to the life of Coiter the introductory pages include an appreciation of Coiter as physician by Dr. Nuyens and as comparative anatomist, physiologist, and embryologist by Dr. Schierbeek. His attainments in these capacities are illustrated in the passages from his works which follow in Latin text and English translation. The selections are wisely made and satisfying in both content and quantity, but they are marred by a variety of infelicities. Errors in the original Latin are repeated without notation, and new misprints occur. There is a marked dearth of accents in the Greek. Omissions are evident at numerous points in the translation from the Latin, and the interpretation of certain passages is open to question, as it is of course in any translation from any language. Many mistakes in English idiom and spelling remain, and misprints and incorrect syllabications are frequent.

But not one of these criticisms can lessen the real value of this volume, for here in convenient form is the Latin text which, because extant copies of the original editions are few, is not readily accessible elsewhere, and here, for those who cannot read the Latin, is an adequate translation into English. And the volume, be it remembered, is a labor of love by the Dutch to honor a native of Groningen who, to our present knowledge, did his greatest work in Germany and never returned to the land of his birth when once he had left it as a student in 1555.

Even under the most favorable circumstances the printing of facing pages of text and translation is a difficult job. With Latin and English, since the former language is more succinct, adjustments in spacing are necessary and have been handled well here. The volume is supplied with twenty-five plates (one between XI and XII unnumbered, the numeral XIX occurring twice) which are beautifully reproduced, largely from the original plates in editions of Coiter and from title-pages of certain copies; the copy used in IV is not identified, but the curious reader can easily decipher the Utrecht stamp. The folding plate XIX is an especially ingenious adaptation, since English had to be added to the Latin, of Coiter's diagrammatic presentation of the differences in birds. A list of plates should have been provided with the table of contents.

Due recognition is given in the introductory pages to the contributions made by Prof. Howard B. Adelmann and Dr. Walton B. McDaniel, 2d to the study of Coiter. One wishes that in addition Prof. Adelmann's translation on the development in the egg of the common fowl through the twentieth day had been reprinted here, and no new translation of that portion of Coiter's work attempted. It is pleasant to report that study of Coiter con-

tinues, and continues international. The newest contribution by Dr. Robert Herrlinger appears appropriately in the Notes and Events section of this issue of the Journal.

LUCIEN SCHELER. *Lavoisier et la Révolution française. I. Le Lycée des Arts.* Paris, Hermann, 1956. 80 pp.

Reviewed by DENIS I. DUVEEN, *New York.*

THIS small but welcome and important addition to our knowledge of Lavoisier's activities during the French Revolution is written by Lucien Scheler who has so notably helped numerous collectors, including the present reviewer, by his scholarly and erudite activities as a bookseller. Scheler informs us in his introduction that this book concerns only one phase of the great chemist's multifarious activities during the tumultuous period in question: he promises further similar studies, and it is to be hoped that they are soon published.

The book starts with a valuable account of the origins and functions of the *Lycée des Arts* which have been generally ignored although a very recent paper by W. A. Smeaton ("The early years of the *Lycée des Arts.* A chapter in the lives of A. L. Lavoisier and A. F. de Fourcroy," *Ann. Sci.,* 1956, *11*) makes some of the information available to English-speaking scholars. In this account Scheler clears up once and for all any confusion that may have existed in people's minds about the *Musée de Monsieur* founded by Pilatre de Rojier and subsequently known as the *Lycée* and the *Lycée des Arts.*

Scheler then gives an account of two extant but incomplete runs of the *Journal du Lycée des Arts* which he has consulted and which have not been previously described. Extracts from these give a good idea of the important rôle played by Fourcroy who appears to have been the leader in establishing the new organization. This is followed by complete printings of a number of hitherto unrecorded papers by Lavoisier which throw new light on his activities at this period.

The first of these (May 1793) consists of a report by Fourcroy and Lavoisier, read before the *Lycée* by the latter, on Berthollet's new process for bleaching linen.

The second (June 1793) contains a detailed account by Lavoisier of the activities during April (1793) of the *Académie des Sciences* which was contained in two consecutive issues of the *Journal.*

The third item (July 1793) consists of a petition on public education submitted by the board of directors of the *Lycée* to the *Convention Nationale* and signed by Lavoisier (President) and Desaudray (Secretary). The August issue of the *Journal* contains an account of a meeting held earlier that month at which Lavoisier had expressed his regret at seeing the *Académies* destroyed but stated his realization that the organization of these bodies no longer suited the spirit of the times.

The September issue of the *Journal* contains by far the most weighty of Lavoisier's contributions. This deals exclusively with the work done under the auspices of the *Académie des Sciences* relative to the establishment of the metric system and which Lavoisier obviously intended to be a justification for the continuation of the existence of the *Académie* whose life he so valiantly if fruitlessly defended during the first seven months of 1793. Scheler's small book concludes by giving in full a report made by Lagrange to the *Lycée* in 1796 on the progress made recently by chemistry and the debt owed to Lavoisier's pioneering work in that science.

This contribution to the history of science underlines the necessity for further intensive work on Lavoisier's rôle during the Revolution and stresses once more the paradoxical and puzzling relationship that existed between him and Fourcroy.

MARVIN K. OPLER. *Culture, Psychiatry, and Human Values. The Methods and Values of a Social Psychiatry.* With a foreword by Thomas A. C. Rennie. Springfield, Ill., Charles C Thomas, 1956. xiii, 242 pp. $6.00.

Reviewed by ILZA VEITH, *Assistant Professor of Medical History, University of Chicago School of Medicine, Chicago, Illinois.*

WITHIN recent years psychiatry, more than any other medical discipline, has allied itself with the social sciences to the extent whereby an interdisciplinary field, that of social psychiatry, has come into being. This book represents a synthesis of the vast amount of material which links psychiatry with the social sciences in general, and particularly with anthropology.

The author, who has spent years in anthropological researches, and who is now a member of the Department of Psychiatry at Cornell University Medical College, sums up and reviews critically a great many of the writings in the field of cultural anthropology and psychodynamics. Dr. Opler defines social psychiatry as being concerned with the impact of social and cultural environment upon the development of personalities, and he traces the effects of culture upon the individual throughout the course of his life. He agrees with the words of Edward Sapir that "the worlds in which different societies live are distinct worlds, not merely the same world with different labels attached."

Such beliefs must necessarily modify those Freudian concepts which gauge all human behavior according to the standards of the Viennese bourgeoisie of the late nineteenth century. And, indeed, by the example of the sharp criticism of *Totem and Taboo* culminating in Malinowski's rebuttal he demonstrates the complete impossibility of applying the same basic concepts to more than one culture. Dr. Opler illustrates the relationship of different cultures to normal and aberrant behavior by pointing to writings on various Asian and African and American Indian behavior patterns and arrives at the conclusion that today *Totem and Taboo* "can only be reviewed as poetic fantasy." In touching upon the Dancing Mania and Taran-

tism of the Middle Ages, he finds few parallels to modern Western aberrant behavior and is rather reminded of a specific madness of New Guinea, and of the ghost dances of the Plains and Ute Indians. With this comparison he suggests that mental illness is neither immutable in time nor impossible to duplicate cross-culturally in specifically suitable periods and places.

The book is divided into two major parts of which the first deals with the social and cultural backgrounds of mental illnesses and the second with the psychology of cultures and peoples. The first section begins with a discussion of the methodology of social psychology and contains, among others, chapters on epidemiological studies of mental disorders, the prevalence and incidence of psychiatric illnesses, variations in psychopathology, and personality differences in various cultures. The second section, which is somewhat shorter, is an elaboration of the main title. Throughout the volume Dr. Opler tends to speak through the authorities quoted by him and only occasionally draws aside the veil of apparent impartiality to pronounce his own conclusions. But his selection of authorities and the nature of his own statements reveal him as a critical thinker who cuts across many schools of thought and is unafraid to take issue with hallowed beliefs.

The book is admittedly a review of the writings of others in this enormously involved field; to do justice to his subject and to his sources of information the author carries the reader on a temporal and spatial marathon which does not make for easy comprehension. Yet the ideas expressed are of such importance and value that the reader's efforts are well rewarded. The book is far from historical; nevertheless to the medical historian and the historian of science it is of specific interest in that it presents almost inadvertently the brief and recent history of the emergence of social psychiatry as a new and doubtless permanent socio-medical specialty.

GEORGE B. GRIFFENHAGEN and CALVIN H. HUGHES. *The History of the Mechanical Heart.* Washington, Smithsonian Institution Report (Publication 4241) for 1955, pp. 339-356, 4 pl., 1956. Free on request.

Reviewed by the EDITOR.

THIS succinct essay describes the growth of our knowledge concerning the vascular system from the second millenium B.C. through Hippocrates and Galen to the Middle Ages and Renaissance, with brief mention of the works of Ibn an-Nafis, Andreas Vesalius, Michael Servetus, Andrea Cesalpino, Realdo Colombo, Gabriello Fallopio, Hieronymus Fabricius, and his pupil, William Harvey, and Richard Lower.

Instruments designed to imitate the pumping action of the heart were first introduced in 1812 by the French physician, Julien-Jean-César Legallois. He recounts the early difficulties encountered because of the tendency of drawn blood to coagulate and the arguments for and against the use of defibrinated blood and the introduction of the anticoagulants. James Blundell's early experiments in which dog's blood was successfully

circulated outside the body through the use of a separate pump are described in detail, also Wild's account of the first perfusion of the isolated heart (1846). In 1866 de Cyon kept the isolated heart of a frog beating for 48 hours, and in 1860 Carl Ludwig made a device which forced blood through various organs at constant pressure from a reservoir. In 1883 Henry Newell Martin of the Johns Hopkins succeeded in keeping the isolated mammalian heart beating for an indefinite period by securing return circulation of blood at body temperature through the coronary vessels. In 1885 von Frey and Gruber introduced the heart-lung preparation. The more recent history of the subject is also described, but little of significance has been added to the von Frey-Gruber heart-lung preparation except for the numerous devices which have been used to insure aeration of the blood in the absence of the lungs. This brief monograph has the virtue of a well-prepared and most useful bibliography.

ELIZABETH M. NUGENT, Ed. *The Thought and Culture of the English Renaissance: An Anthology of Tudor Prose, 1481-1555.* Cambridge University Press, 1956. xix, 703 pp. $7.50.

Reviewed by F. N. L. POYNTER, *Librarian, The Wellcome Historical Medical Library, London, England.*

WHAT better introduction to the intellectual life of a period can there be than a carefully selected and well-edited anthology of its prose writing? Chosen as much for the matter as for its presentation, it can cover a wide range of thought and action and seek its approach at a number of levels, so allowing us to gaze on the authentic picture of an age. Miss Nugent has adopted this medium for offering us a view of one of the most critical and formative periods in the history of the English-speaking peoples and in all respects but one she achieves her purpose admirably. Few would quarrel with her choice of authors, and in introducing them to her readers she has enlisted the help of distinguished scholars, Douglas Bush, F. S. Boas, and H. S. Bennett among them. Beautifully printed and produced, appearing with the imprint of a celebrated press, it is obviously a volume which should be in the possession of anybody who is interested in any aspect of English life in the sixteenth century. When we find that one of its sections is entitled "Tradition and Early Tudor Medicine" and has an introduction said to be by Miss Gertrude Annan, Librarian of the New York Academy of Medicine, we applaud the editor's wisdom, but as we read a worried frown ousts the look of eager anticipation. The opening paragraph strikes a chord of memory and turning to an article entitled "Medicine and the Arts" contributed by Miss Annan to *Ciba Symposia* (1951, *11*, 1367) and mentioned in the editor's acknowledgments, we find that it is indeed a travesty of that article's first paragraph. The last sentence of that paragraph reads: "The historian of medicine may find himself exploring the history of painting or sculpture, of woodcuts or prints, of ceramics, typography, architec-

ture, numismatics, philately and music." This appears in the anthology as "In the absence of early written records, the arts and crafts practised in antiquity record this alliance [of religious, philosophical, and social thought] with such unswerving accuracy that the medical historian finds his prime sources in painting, sculpture, woodcuts, prints, ceramics, typography, architecture, numismatics, philately, and music." It is the first time we have seen "woodcuts, prints, . . . typography . . . and philately" included among the arts and crafts of antiquity! This kind of thing is enough to make the most ill-informed reader pause and stare, but he does not need to be particularly well informed to realise that the whole of this introduction is a hodge-podge—glance, for example at the section headed "Two Great Medical Foundations in Tudor England" and recall the facts which should have appeared under that heading! Nor does it require a highly trained medical historian to detect fundamental misunderstandings and grave errors of fact throughout, although these will not be obvious to the ordinary well-educated person or the student for whom the anthology is intended. Were this review to be written for any journal but one devoted to the history of medicine this unfortunate blot on an otherwise excellent book could be passed over in discreet silence, but I consider it my duty to inform the readers of this journal—to most of whom Miss Annan is known as a distinguished medical librarian and the author of scholarly studies on various aspects of the history of medicine—that Miss Annan is not in fact responsible for these pages and that she was shown no proofs of the matter which was to be put out under her name. We learn in the editor's preface that work was begun on the preparation of this anthology some fifteen years ago, time enough, one might think, to clear up any possible misunderstanding or confusion which might arise over an important matter of this kind. Granted that the editor acted with the best intentions and that, not being herself a medical historian, she could have had no idea of the damage which might be done to Miss Annan's reputation by saddling her with this contribution, the result is that the public has been misled (in more ways than one!), and those who know and appreciate Miss Annan's abilities will certainly agree that it is only common justice that this should be made known to all readers of the volume.

NOTES ON CONTRIBUTORS

CIOCCO, ANTONIO, D.Sc. (Hyg.), is Head of the Department of Biostatistics, Graduate School of Public Health, University of Pittsburgh, Pittsburgh 13, Pennsylvania.

DEWHURST, KENNETH, B.Litt., L.R.C.P., is Senior Registrar in Psychiatry, Littlemore Hospital, Oxford, England.

GREENWALD, ISIDOR, M.D., is a member of the Department of Biochemistry, New York University College of Medicine, 550 First Avenue, New York 16, New York.

GUERLAC, HENRY, Ph.D., is Professor and Chairman of the Department of History, Cornell University, Ithaca, New York.

HERRLINGER, ROBERT is Professor of the History of Medicine at the University of Würzberg and a director of the Georg-Sticker-Institut für Geschichte der Medizin there. With his wife he is engaged in the practice of medicine in Münchsteinach (Kreis Neustadt Aisch), Mittelfranken, Germany.

MARGALITH, DAVID, M.D., is Secretary of the Israel Society of the History of Medicine and Science and a pediatrician residing at 68 Shlomo Hamelech Street, Tel Aviv, Israel.

PERROTT, DOROTHY is Research Fellow in the Department of Biostatistics, Graduate School of Public Health, University of Pittsburgh, Pittsburgh 13, Pennsylvania.

ROSENBERG, ALBERT, Ph.D., is Instructor in English, University of California at Davis, California.

SMITHCORS, J. F. is Associate Professor of Anatomy, College of Veterinary Medicine, Michigan State University of Agriculture and Applied Science, East Lansing, Michigan.

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